# Service Manual

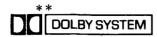
**db**\* Equipped Cassette Deck with Electronic Multi-Mode Counter

RS-M255X

This is the Service Manual for the

following areas.

(Silver Face)



RS-M250 MECHANISM SERIES

#### NOTE:

For the products (RS-M255X) delivered to PX, please refer to the table below and the attached Service Manual, since their parts are the same as those of the silver type products delivered to Asia, Latin America, the Middle East and Africa (regions marked  $\mathbb N$  in the Service Manual) except for the parts listed in the table.

#### PARTS COMPARISON TABLE:

Please revise the original parts list in the Service Manual RS-M255X (of the silver type model for N mark areas) to conform to the changes shown herein.

If new part numbers are shown, be sure to use them when ordering parts.

		Part N		
Ref. No.	Part Name & Description	N···For Asia, Latin America, Middle East and Africa areas. ''Silver Type''	FFor Asian PX. JFor European PX. "Silver Type"	Remarks
G35	Main Name Plate	QGS2985	QGS3036	
A2	Instruction Book	QQT3266	QQT3357	
P1	Inside Carton	QPN4290	QPN4306	

- \* The term dbx is a registered trademark of dbx Inc.
- \*\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

# **Technics**

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P.O. Box 288, Central Osaka Japan

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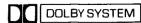
# Service Manual

Cassette Deck

**dbx** Equipped Cassette Deck with Electronic Multi-Mode Counter

RS-M255X

Silver Face





This is the Service Manual for the following areas.

N ...... For Asia, Latin America,
Middle East and Africa
areas.

A ..... For Australia.

- Please use this manual together with the service manual for model No. RS-M255X (original) order No. ARD82010116C2-29.
- For schematic diagrams, circuit board (Voltage Regulator Circuit Board), wiring connection diagram (Power Supply) and parts lists, refer to the ones in this Service Manual.

  For other information, refer to both this Service Manual and the original Service Manual.

# RS-M250 MECHANISM SERIES Specifications

Track system: 4-track 2-channel stereo recording and playback

Tape speed: 4.8cm/s (1-7/8ips)
Wow and flutter: 0.038% (WRMS)

Frequency response: Metal tape;  $20 - 20,000 \,\text{Hz}$ 

 $30 - 17,000 \,\mathrm{Hz} \,\pm 3 \,\mathrm{dB}$ 

CrO<sub>2</sub> tape; 20 - 19,000 Hz

 $30 - 16.000 \,\text{Hz} \pm 3 \,\text{dB}$ 

 $30 - 16,000 Hz \pm 30$ 

Normal tape;  $20 - 18,000 \,\text{Hz}$ 

 $30 - 15,000 \,\text{Hz} \pm 3 \,\text{dB}$ 

Dynamic range: 110 dB (at 1 kHz) with dbx in

Max. input level

improvement: 10 dB or more improved with dbx in (at 1 kHz)

Signal-to-noise ratio: dbx\* in; 92 dB

Dolby NR in; 68 dB (above 5 kHz)

Dolby NR out; 58 dB (signal level = max. input level A weighted, CrO<sub>2</sub> type tape)

East forward and

rewind time: Approx. 90 seconds with C-60 cassette tape

Inputs: MIC; sensitivity 0.25 mV, applicable microphone

impedance  $400\Omega - 10 \,\mathrm{k}\Omega$ 

LINE; sensitivity 60 mV, input impedance  $47 k\Omega$  LINE; output level  $700 \, \text{mV}$ , load impedance  $22 \, k\Omega$ 

Outputs: LINE; output level

HEADPHONES; output level  $125\,\text{mV}$  (at  $8\,\Omega$ )

Bias frequency: 85kHz

Motor: 2-motor system

Heads: 2-head system

1-SX (Sendust Extra) head for record/playback

1-double-gap ferrite head for erasure

Rower requirement: AC; 110/125/220/240 V, 50-60 Hz

preset power voltage 240 V

Power consumption: N ······ 18W

☐ ······ 28W

Dimensions: 43.0cm(W) × 10.8cm(H) × 33.1cm(D)

Weight: 6.0k

Specifications are subject to change without notice. \* The term dbx is a registered trademark of dbx lnc.

\*\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

## **Technics**

Matsushita Electric Trading Co., Ltd. P.O. Box 288, Central Osaka Japan

### **RS-M255X**

NOTES: RESISTORS

ERD.....Carbon

ERG.....Metal-oxide

ERS.....Metal-film

ERX....Metal-film

ERQ.....Fuse type metallic

ERF.....Cement

CAPACITORS ECBA .....Ceramic ECG□.....Ceramic ...Ceramic ECKD.... ECC□.. .. Ceramic ..Ceramic **ECQM** ..Polyester film ECQE ..Polyester film ECQF ..Polypropylene ECET. Electrolytic ECECIN. .. Non polar electrolytic .. Polystyrene ECQS .. ECSI. ..Tantalum

.. Tantalum

#### REPLACEMENT PARTS LIST

Important safety notice
Components identified by  $\triangle$  mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

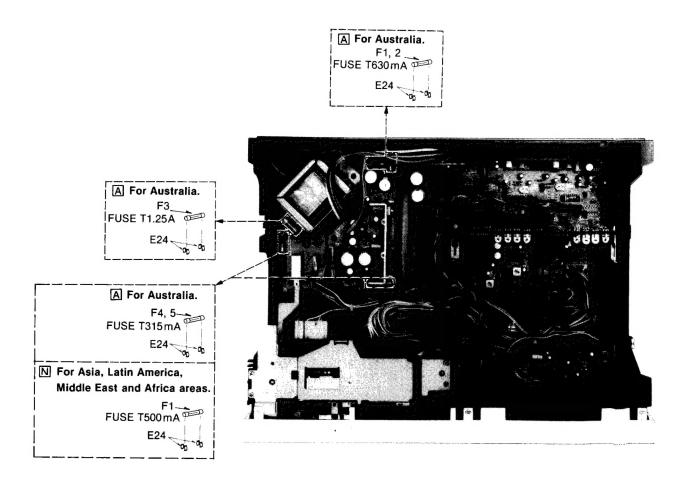
Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
R	ESISTORS	R 132 R 133, 134	ERD25TJ183	R 289, 290 R 291, 292	ERD25FJ103 ERD25TJ155	R 419 [A] [For Au	ERD25FJ121	C 25, 26 C 27, 28	ECKD1H392KB ECEA1AS470	C 217, 218 C 219, 220	ECQM1H103JZ ECCD1H101KC
	0,	1 100, 104	ERD25TJ274	R 301, 302,			ERD25FJ821	C 29, 30	ECEA50M1R	C 221, 222,	
R 1, 2	ERD25TJ273	R 136	ERD25TJ223		ERD25FJ471		a, Latin America.	C 31, 32	ECKD1H103ZF		ECEA25Z4R7
R 3, 4	ERD25TJ474 ERD25FJ471	R 137	ERD25TJ123	R 305	ERD50FJ221		East and Africa	C 33, 34	ECEA16M10R	C 225, 226,	
R 5, 6 R 7, 8	ERD25FJ332	R 138	ERD25FJ562	D 206 207	ERD25TJ473	areas.]	EDD50E 1224	C 35, 36	ECEA1AS221	C 220 220	ECQV05104JZ
R 9, 10	ERD25FJ680	R 139 R 140	ERD25FJ100 ERD25FJ562	R 306, 307 R 309	ERD25TJ223	[A]	ERD50FJ331	C 37, 38 C 39, 40	ECQV05334JZ ECQM1H392JZ	C 229. 230,	ECQM1H332JZ
R 11, 12	ERD25FJ103	R 141	ERD25FJ1R0	R 310	ERD25TJ104	R 421	ERD25TJ104	C 41, 42	ECQM1H472JZ		
R 13, 14	ERD25TJ334	R 142	ERD25FJ822	R 311	ERD25TJ473	R 422	ERD25TJ223			C 233, 234 C 235, 236	ECCD1H331K ECQV05104JZ
R 15, 16 R 17, 18	ERD25FJ472 ERD25FJ562			R 312	ERD25FJ183	R 423	ERD25TJ123	C 43, 44	ECEA1HS100	C 237, 238	ECQV031043Z ECQM1H103JZ
R 19, 20	ERD25TJ225	R 143 R 144	ERD25TJ154 ERD25TJ124	R 314 R 315	ERD25FJ182 ERD25FJ102	R 424	ERD25FJ560	C 45, 46 C 47, 48	ECQM1H273JZ ECEA50MR33R	C 239, 240	ECQM1H102JZ
		R 145	ERD25TJ473	R 316	ERD25FJ103	R 425, 426		C 49, 50	ECQM1H104JZ	C 241, 242	ECEA16M10R
R 21, 22	ERD25FJ332	R 146	ERD25FJ332	R 317	ERD25FJ472		ERD50FJ181	C 51, 52	ECEA1HS100	C 243, 244	ECEA1HS100
R 23, 24 R 25, 26	ERD25TJ225 ERD25FJ101	R 147	ERD25FJ103	R 318	ERD25FJ472		a, Latin America.	C 53, 54	ECFDD473KXY	C 245 C 247, 248	ECQM1H102JZ ECEA1ES470
R 29, 30	ERD25FJ103	R 148	ERD25FJ332	R 319	ERD25TJ154	Middle areas.)	East and Africa	C 55, 56 C 57, 58	ECEA1AS471 ECQM1H562JZ	C 249, 250	ECCD1H151KC
R 31, 32	ERD25FJ681	R 149 R 150	ERD25FJ222 ERD25FJ822	R 320	ERD25TJ154		ERD50FJ271	C 59, 60	ECQV05224JZ	C 301	ECFD104KXY
R 33, 34	ERD25FJ100	R 151	ERD25TJ154		ERD25TJ683	[For Au		C 61, 62, 63			E0EBB0000000000
R 35, 36	ERD25FJ182	R 152	ERD25TJ563	R 323, 324	ERD25TJ563		ERD25FJ392		ECEA1HS100	C 302 C 303, 304	ECFDD223KXY ECEA50Z1
R 37, 38 R 39	ERD25FJ472 ERD25FJ561	D 450	EDDOEF 1474		ERD25TJ224	[For Au		0.05.00	ECEADENIADA	C 305, 306	ECEA50ZR47
R 40	ERD25FJ822	R 153 R 154	ERD25FJ471 ERD25FJ122	R 327, 328 R 329	ERD25FJ222 ERD25FJ100	For Au	ERD25FJ562 stralia.l	C 65, 66 C 67, 68	ECEA25N3R3 ECQV05154JZ	C 307, 308	ECEA1HS100
		R 155, 156		R 330	ERD25FJ562	R 430[A]	ERD25TJ683	C 69, 70	ECEA50Z1	C 309	ECEA1ES101
R 41, 42	ERD25TJ123 ERD25FJ151	R 157, 158	ERD25TJ183	R 331	ERD25FJ562	[For Au	stralia.]	C 71, 72	ECEA50Z2R2	C 310 C 311	ECFDD473KXY ECKD1H682MD
R 43, 44 R 45, 46	ERD25FJ151	R 159, 160		IR 332 IR 333	ERD25TJ473 ERD25TJ104	R 501, 502,	503, 504, 505 EBD26T 1472	C 73, 74	ECQM1H273JZ	C 401 A	ECEA1ES332
R 47, 48	ERD25TJ274	R 161 R 162	ERD25TJ223 ERD25FJ101	R 334	ERD25TJ104	R 506	ERD25TJ473 ERD25FJ331	C 75, 76 C 77, 78	ECQM1H682JZ ECQM1H153JZ	C 402 🛕	ECEA1ES101
R 49, 50,	51, 52	R 163, 164		R 335	ERD25TJ473	R 507	ERD25FJ271	C 79, 80	ECQM1H333JZ	C 403	ECKD1H103ZF
D 50 54	ERD25TJ105	R 165, 166	ERD25FJ562	R 336	ERD25FJ332	R 508	ERD25FJ331	C 81, 82	ECQM1H683JZ	C 404	ECEATERS20
R 53, 54 R 55, 56	ERD25TJ473 ERD25FJ332	R 167	ERD25FJ100		ERD25TJ684	R 509	ERD25FJ271	C 83	ECEA1CS221	C 404	ECEA1ES220 ECEA1CS331
R 57, 58	ERD25TJ274	D 169 160	ERD25FJ102		ERD25FJ562 ERD25FJ102	R 510	ERD25FJ331	C 84	ECEA1CS471	C 406	ECKD1H103ZF
R 59, 60	ERD25TJ184	R 170	ERD25FJ821	R 402	21.020.0102	R 511	ERD25FJ271	C 85, 86	ECQV0568JZ	C 407 🛕	ECEA1ES222
R 61, 62	ERD25FJ332	R 171	ERQ12HJ100		ERQ12HJ2R7	R 512	ERD25TJ104	C 87, 88	ECEA1ES220	C 408 A	ECEA1ES101
R 63, 64	ERD25FJ181		ERD25TJ104		a, Latin America,	R 513	ERD25TJ223	C 89, 90	ECKD1H102KB	C 409 C 410	ECKD1H103ZF ECEA50Z1
R 65, 66	ERD25FJ101	R 205, 206 R 207, 208		areas.]	East and Africa	R 514 R 515	ERD25FJ562 ERX12ANJR47	C 91, 92 C 93, 94	ECQM1H392JZ ECKD2H121KB	C 411	ECEAICS331
R 67, 68	ERD25TJ223	R 209, 210			ERX12ANJ2R7	R 516	ERD25FJ1R5	C 95, 94	ECCD1H101KC	C 412	ECKD1H103ZF
R 69, 70	ERD25TJ154		ERD25TJ124	[For Aus	tralia.]	R 517	ERD25FJ222	C 97	ECEA1AS101	C 413 [A	
R 71, 72 R 73, 74	ERD25FJ102 ERD25FJ392	R 213, 214			ERD25FJ102	R 523	ERD25FJ222	C 98	ECEA1HS100	[For Aus	tralia.j
R 75, 76	ERD25FJ681	R 215, 216	ERD25FJ472		ERD25FJ821 a, Latin America.	R 524 R 525	ERD25FJ102 ERD25FJ272	C 99	ECEA50ZR47	C 414 A	ECEA1CS471
R 77, 78	ERD25FJ820	B 217, 218	ERD25TJ473		ast and Africa	11 323	LINDZOI UZIZ	C 100	ECEA1HS100	C 415, 416	
R 79, 80	ERD25FJ392	R 219, 220		areas.]		R 526	ERD25FJ562		ECEA1CS330	ΔΔ	ECEA1CS472
R 81, 82, 8	83, 84 ERD25FJ152		ERD25FJ103		ERD25FJ471	R 527	ERD25FJ471		ECFDD223KXY	C 417, 418	ECEA1HS100
	LIID231 8 132		ERD25TJ473 ERD25FJ470	[For Aus	stranaj	R 701 R 702	ERD25FJ222 ERD25FJ221	C 105, 106 C 107	ECEA1HS100 ECEA1HF100	C 419	ECKD1H103ZF
R 85, 86	ERD25FJ270		ERD25TJ124	R 405 [A]	ERD25FJ391	R 703	ERD25FJ331	C 107	ECQM1H822KZ	C 420 [A	ECQP1103JZ
R 87, 88	ERD25FJ562		ERD25FJ332	[For Aus		R 704	ERD25FJ102	C 109	ECKD1H103ZF	[For Als	
R 89, 90 R 91, 92	ERD25FJ682 ERD25FJ821		ERD25TJ473	R 406	ERD25FJ332	R 705, 706	ERD25FJ821	C 110	ECFDD153KXY	C 421 C 422	ECEA1ES470 ECEA1ES220
R 93, 94	ERD25TJ473	R 233, 234	, 235, 236 ERD25TJ104	R 407 R 408	ERD25FJ472 ERD25FJ103	VARIARI	E RESISTORS	C 111 C 112	ECQP1153JZ ECEA1HSR33	C 423	ECEA1ES470
R 95, 96	ERD25FJ820	R 237, 238	ERD25FJ103		ERD25FJ102	VALUE	L NEGIOTOTIO	0 112	ECEA IFIONOS	C 424	ECEA1ES220
R 97, 98	ERD25FJ560			R 410		VR 1, 2	EWJ5SAF22A24	C 113	ECEA50Z1	C 425, 426	ECFDD104KZY
R 101	ERD25FJ222 ERD25TJ224		ERD25TJ333		ERQ12HJ2R7	VR 3, 4	QWKGTA024A54	C 114	ECEA50ZR22	C 427	ECEA50Z3R3
R 103	ERD25TJ473	R 241 R 242	ERD25FJ102 ERD25FJ102		a, Latin America, East and Africa	VR 5, 6 VR 7, 8, 9,	EVNM4AA00B24	C 115	ECEA1HS100 ECEA25Z4R7	C 428, 430	ECFDD104KZY
			ERD25TJ473	areas.)			EVNM4AA00B15		ECEA1CS330	C 431 ▲	ECEA1CS472
R 104	ERD25TJ563	R 245, 246	ERD25FJ101			VR 201, 20	2, 203, 204	C 118, 119	ECQM1H104JZ	C 435	ECKDIH103ZF
R 105 R 106	ERD25FJ472 ERD25TJ473		ERD25TJ473	For Aus			EVNM0AA00B54		ECKD1H103ZF	C 502 C 503	ECKD1H102MD ECCD1H331K
R 107	ERD25TJ273		ERD25FJ103 ERD25FJ102	R 411 🛆	ERD25FJ102 ERD25FJ103	VR 205, 200	5, 207, 208 EVNM0AA00B14		ECKD1H223ZF	C 503	ECEAIAS221
R 108	ERD25FJ472		ERD25FJ102 ERD25FJ392	R 413	ERD25TJ823	VR 301	EVNM4AA00B24	1		C 505	ECKD1H332ZF
	ERD25TJ473		ERD25TJ333		ERX2ANJ5R6	VR 302	EVNM4AA00B53		ECCD1H221K	C 506	ECEA50ZR2R2
R 111 R 112, 113	ERD25TJ104		ERD25TJ104	R 415		VR 501	EVNK4AA00B14		ECKD1H103ZF   ECKD1H472MD	C 507	ECKD1H222MD
1	ERD25TJ473		ERD25FJ472		ERD25FJ182	CAF	ACITORS	C 131	ECKD1H103ZF	C 508	ECEAICN100
R 116	ERD25FJ562		ERD25TJ333	[For Asia	a, Latin America,				ECKD1H223ZF	C 511	ECEA50ZR1
R 117	ERD25TJ223		ERD25FJ682		ast and Africa	C 1, 2	ECEA1HS100		ECQM1H152JZ ECKD1H102KB	C 702	ECCD1H390JC
R 118	ERD25TJ224		ERD25FJ472 ERD25FJ220	areas.]	ERD25FJ102	C 3, 4	ECFDD103KXY	C 137, 138		C 703 C 704	ECCD1H101JC ECCD1H470JC
R 119	ERD25FJ152		ERD25TJ393	[For Aus	tralia]	C 5, 6 C 7, 8	ECEA50Z1 ECEA50ZR47		ECKD1H223ZF	C 704	ECKD1H102KB
R 120	ERD25TJ273	R 271, 272	ERD25TJ473	R 416	ERD25FJ103	C 9, 10	ECKD1H681KB	C 148	ECKD1H392KB		
R 121, 122			ERD25FJ332	R 417	EDD265 1924	C 11, 12	ECEA1AS221	C 201, 202 C 203, 204	ECEA25Z4R7	COMBIL	ATION PARTS
R 124	ERD25TJ473 ERD25TJ104	n 2/5, 2/6	ERD25TJ333	[A] 🔼 For Aus	ERD25FJ821 tralia.l	C 13, 14	ECQM1H123JZ	0 203, 204	LOEASUZ I	Z 501	EXBEQ5273K
R 125	ERD25FJ101		ERD25TJ394	R 418 [N]	ERD25FJ821	C 15, 16	ECCD1H181K	C 205, 206,		Z 502	EXBD86181K
R 126	ERD25FJ821		ERD25FJ102			C 17, 18	ECQM1H152JZ	0.000	ECQV05104JZ	Z 503	EXBEQ4272K
	B ERD25FJ391		ERD25FJ8R2		ast and Africa	C 19, 20	ECQM1H123JZ		ECQV05334JZ ECCD1H221K	Z 504	QCRFWA1
R 129 R 130	ERD50FJ560 ERD25FJ103	R 285	ERD25TJ333 ERD25FJ103	areas.]	ERD50FJ331	C 21, 22, 23	3. 24		ECQM1H103JZ	Z 505 Z 506	EXFP4472Z EXBD8825K
R 131	ERD25TJ104	R 287	ERD25FJ392	[For Aus		,	ECEA50Z1				EXRPIS2K473T

## RS-M255X

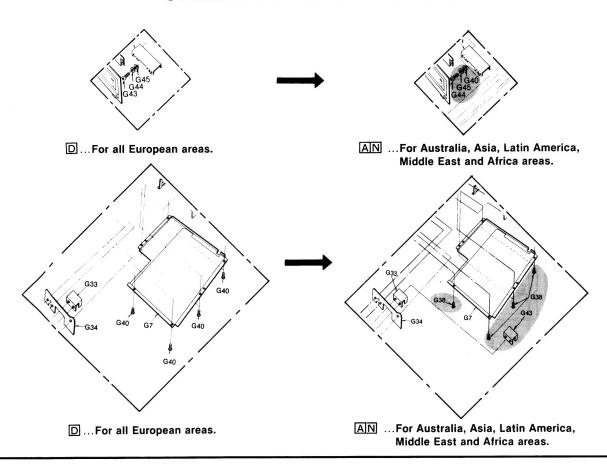
Ref. No.	Part No.	Ref. No.	Part No.	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
TRA	NSISTORS	DIODES	& RECTIFIERS	E 27 E 28	QJT0015 QTH1164	Lug Terminal Heat Sink		MECHA	NICAL PARTS
Q 1, 2 Q 3 Q 11, 12, 13 Q 15, 16 Q 17, 18 Q 19 Q 21, 22, 23 Q 25 Q 26 Q 27	2SK104F 2SD965 2SD965 2SA921S	D 16 D 17, 18, 19 202, 203, 305, 306 D 401, 402, 407, 408,	403, 404, 405, 406, 409 SM112 MA1056 MA161	E 29 E 30 E 31 E 32 E 33 E 34 E 35 E 36 E 37 E 38 E 39	XSN3 + 8S XWA3B XWE3 N024B N018E QSIFM004F QJT1067 QKJ0520 QJS15001T QKJ0521 QJC0050	Screw ⊕3×8 Washer 3₀  Washer 3₀ Insulator Plate Insulator Plate FL Meter Check Pin LED Holder-A 15 Pin Socket LED Holder-B Earth Plate	M 1 M 2 M 3 M 4 M 5 M 6 M 7 M 8 M 9	QMA4330 QBP1894 QBP1895 QXG1059 QDR1146 QMB1336 QML3665 QML3660 QML3661 QMZ1283	Flywheel Retainer Head Base Plate Spring Cassette Pressure Spring Main Gear Supply Reel Table Reel Table Hub Cam Follower Idler Select Lever Erase Safety Lever Flywheel Thrust Retainer
Q 28, 29, 30 Q 32 Q 33, 34, 31 41, 42 Q 201, 202 Q 203, 204 Q 205, 206, 211, 212,	0, 31 2SD636 2SB641 5, 36, 37, 38, 39, 2SD636 2SK104F 2SD636 ,207, 208, 209, 210, ,213, 214, 215, 216, 219, 220	D 416 D 501, 502,	MA1033 503, 504, 505, 506, 509, 510, 511, 512,	E 40 E 41 E 42 E 43 E 44 E 45 E 46 E 47 E 48 E 49	QMA4365 XTN3 + 6B XAMQ44P300 QJS06001T QJP06S001T QJP15L001T QNQ1070 QNQ1039 QNQ1039 QNQ1004	Timer Angle  Tapping Screw ⊕3×6 Pilot Lamp 6 Pin Socket 6 Pin Post 12 Pin Post (L-type) 15P Post (L-type) Nut Nut Nut	M 11 M 12 M 13 M 14 M 15 M 16 M 17 M 18 M 19 M 20	QDB0306 QDB0287 QDK1012 QBW2008 QBW2046 QBN1772 QBT1725 QBT1927 QBT1927 QBT373	Capstan Belt Reel Motor Belt Steel Ball Snap Washer Snap Washer Erase Safety Lever Spring Lock Lever Spring Head Base Plate Spring Idler Spring Reel Table Spring
Q 221, 222, Q 225 Q 227	2SD1010 , 223 2SD636 2SB641 2SD636	INTEGRA IC 1, 2 IC 3, 4	AN6212 NE646N	E 50 E 51 E 52 E 53	QJS1923TN QJS1922TN QJS1921TN QJT1054	9 Pin Socket 6 Pin Socket 3 Pin Socket Contact	M 21 M 22 M 23 M 24	XTN2 + 6B XTN26 + 6BFZ XTN3 + 24B XUB4FT	Tapping Screw ⊕2×6 Tapping Screw ⊕2.6×6 Tapping Screw ⊕3×24 Stop Ring
Q 301, 302 Q 303, 304 Q 401 Q 402		IC 5, 6 IC 7 IC 8 IC 9	AN6213 AN6256 AN6214 BA336 UPC1252H	E 54 E 55 E 56	XTN3 + 10BFN QJi1466RR QJT1089	Tapping Screw ⊕3×10 Leaf Switch Circuit Board Contact SONATOR	M 25, 26 M 27 M 29 M 30	XTN3 + 10B XTN26 + 8B QXD0120 QMK1867	Tapping Screw ⊕3×10 Tapping Screw ⊕2.6×8 Takeup Reel Table Assembly Head Base Plate
Q 403 Q 404 Q 405	2SA564 2SB895 2SD946	IC 203, 204	UPC1253H2 NJM4558DF AN6870N	X 701	QZE0049	Crystal	M 31 M 32	QMZ1252 QBC1103	Head Spacer Head Spring
Q 406 [A] [For Aus Q 407 Q 408	2SC945P	IC 302, 303 IC 304 IC 305 IC 501 IC 502 IC 503 IC 701		L 1, 2 L 3, 4 L 5, 6 L 8 L 501 L 502, 503	QLQX0332KWA QLQX0343KWA QLM9Z9K QLQX0332KWA ELEH101KA 3 QLQZ1014D	Bias Trap Coil MPX Filter	M 33 M 34 M 35 M 36 M 37 M 38 M 38-1 M 39 M 40 M 41	XSN2 + 16 XWG2 QXA1232 QML3865 QBT1955 QXA1222 QBT1755 QXA1076 QML3651 QML3653	Screw ⊕2×16 Washer 2¢ Brake Plunger Assembly Plunger Lever Plunger Spring Side Angle Spring Side Angle Spring Trigger Plunger Assembly Trigger Plunger Lever Control Lever
Ref No		Part Name	e & Description	T 1 T 401 △	QLB0198K QLPN74EMX	Bias Oscillation Coil AC Power Transformer	M 42 M 45 M 46	QBT1278 QXU0280 QXA1077	Record Lock Lever Spring Capstan Motor Assembly Motor Retainer Assembly
[Fo	QWY4123Z QWY2138Z IA RJA52YAK or Asia, Latin Ameri eas.]	Record/Pla Erase Hea AC Power ca, Middle E	ayback Head d Cord East and Africa	[For A areas.] F 1, 2	XBA2E05NS5 sia, Latin Ameri	FUSES  Fuse (T 500mA) ca, Middle East and Africa	M 47 M 48 M 49 M 50 M 51 M 52 M 53	QDB0286 QXP0621 XSN26 + 3 QXU0250 QBN1878 QBP1946 QXL1406	Takeup Belt Takeup Pulley Screw ⊕2.6×3 Reel Motor Assembly Holder Spring Cassette Lock Spring Pressure Roller Lever
E 4   Fo are	I A SJA23 or Australia.] [N] QTD1129 or Asia, Latin Ameri eas.] [A] QTD1164	AC Power  Cord Bush ca, Middle E  Cord Bush	ing East and Africa	[For A F 3 [A] <b></b>	XBAQ0008 ustralia.] XBAQ125028 ustralia.]	Fuse (T 630 mA) Fuse (T 1.25A)	M 53-1 M 54 M 55 M 56 M 57	QBN1771 QMN2625 QXL1423 QXi0116 QXL1408	Pressure Roller Spring Eccentric Pin Idler Lever Assembly Takeup Idler Swing Gear Lever Assembly
E 5 E 6 E 7 E 8 E 9	Or Australia.]  QMA4402  XTN3 + 16B  XTN3 + 10B  XTN3 + 8B  XTS3 + 12B	Tapping So Tapping So Tapping So	crew ⊕3 × 16 crew ⊕3 × 10 crew ⊕3 × 8 crew ⊕3 × 12		XBA0006 ustralia.]  SW QSR8402	Fuse (T 315mA)  //TCHES  Rotary Switch (NR Selector)	M 58 M 59 M 60 M 61 M 62	QXL1409 QML3659 QBG1132 QXL1411 QXF0190	Fast Wind Arm Assemiby Brake Lever Brake Rubber Lock Lever Assembly Flywheel Assembly
E 10 E 11 E 12 E 13 E 14 E 15 E 16 E 17	XIB3 + 10BFN  QID1181 QEJ5003S QJP1921TN QJP1922TN QJP1923TN QJP1924TN QJP1924TN	Wire Clam Jack Board 3 Pin Post 6 Pin Post 12 Pin Post 12 Pin Post 12 Pin Soc	d st	S 402 A S 501, 502	QSW1117AS QSR1407 2, 503, 504, 505, QSW1118 0, 511, 512 QSWY409	Push Switch (Power ON/OFF) Rotary Switch (Voltage Selector)	M 63 M 64 M 65 M 66 M 68 M 69	QMA4358 QMA4359 XTN3 + 8B XTN26 + 6BFZ XTN26 + 10B QXH0390 "Silver Type" QXH0390K	Center Angle Side Angle-R Tapping Screw ⊕3×8 Tapping Screw ⊕2.6×6 Tapping Screw ⊕2.6×10 Mechanism Cover
E 18 [N] [Fo	△ Q0R0008 or Asia Latin Ameri eas.] △ Q0R0011	Spark Kille	er East and Africa	S 513 S 601 S 602	QSS1303 QSB0260 QSB0260	Slide Switch (Timer Switch) Leaf Switch (Erase Safety Switch) Leaf Switch	M 70 M 71 M 72 M 73	"Black Type" QBT1691 QBT1566 QXL1414 QXL1507	Lamp Lever Spring-B Intermediate Lever Spring Lock Lever-A Lock Lever-B
[Fo E 19 E 20	or Australia.) SJ1777 XTN3 + 8B OMA4364	Pin Termin	al crew ⊕3×8	S 603 S 604	QSB0261 QSB0260	(Mode Sensing Switch) Leaf Switch (Stop Switch) Leaf Switch (Playback Switch)	M 74 M 75 M 76 M 77	XUC25FT QXR0780 QKJ0499 QDG1254	Stop Ring Eject Rod Assembly Dumper Gear Holder Dumper Gear
E 22 E 23 E 24	X\$N3 + 8S X₩A3B	Screw ⊕3: Washer	×8	S 605 S 606, 607	QSB0261 QSB0266	Leaf Switch (Half Detection Switch) Leaf Switch	M 78 M 79 M 80	XNG26 XSN26 + 8B QMH2085 "Silver Type"	Nut Screw ⊕2.6×8 Cassette Holder
[Fo	M Q1F1007 or Asia Latin Americ eas.] M Q1F1054		ast and Africa			(Auto Tape Selector)	M 81 M 82	QMH2085K "Black Type" XWG26 QMA4072	Cassette Holder  Washer 2.6¢ Auto Tape Selector Angle
[Fo E 25 E 26	or Australia.] QJS12001T XTN3 + 10B	12 Pin Soc		J 1 J 2	QJA0259 QJA0262	Headphones Jack Microphone Jack	M 83	QML3716	Tape Detection Lever (for Normal/CrO <sub>2</sub> Tape)

Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
M 84	QML3717	Tape Detection Lever	G 12	QXB0759	Operation Button (Pause)	G 30	QMK1959	Sub Chassis
		(for Metal Tape)	G 13	QXB0760	Operation Button	G 31	QTW1279	Meter Insulating Plate
M 85	QNM2642	Detection Lever Shaft	1		(Record)	G 32	XTB4 + 10BFN	Screw ⊕4×10
M 86	XTN2 + 6B	Tapping Screw ⊕2×6	G 14	QGO1990	Operation Button	G 33	QTS1575	Microphone Shield Plate
M 87	XWG3	Washer 3ø		"Silver Type"	(Rec-Mute)	G 34	QMA4363	Volume Angle
M 88	XWG26	Washer 2.6¢		QGO1990Y	Operation Button		QGS2985	Main Name Plate
M 89	XTN26 + 12B	Tapping Screw ⊕2.6 × 12		"Black Type"	(Rec Mute)			ica, Middle East and Africa
M 90	XTN3 + 6B	Tapping Screw ⊕3×6				areas.		
M 91	XTN26 + 5B	Tapping Screw ⊕2.6×5	G 15	QGO1991	Operation Button		QGS2975	Main Name Plate
				"Silver Type"	(Fast Forward)		ustralia.}	
	CABI	NET PARTS	İ	QGO 1991Y	Operation Button	G 36	QBH2012	Cover Cushion
			1	"Black Type"	(Fast Forward)	G 38	XTN3 + 10B	Tapping Screw ⊕3×10
G 1	QGCM0058	Case Cover				G 39	XTS3 + 12B	Tapping Screw ⊕3×12
	"Silver Type"		G 16	QGO1993	Operation Button	G 40	XWE3	Washer
	QGCM0058K	Case Cover		"Silver Type"	(Rewind)	G 41	XTN26 + 10B	Tapping Screw
	"Black Type"			QG01993Y	Operation Button (Rewind)			
G 2	QKA1086	Case Foot		"Black Type"		G 42	XTN3 + 12B	Tapping Screw
G 3	QGK3201	Side Board				G 43	QTS1579	Shield Plate
	"Silver Type"		G 17	QGO1994	Operation Button (Stop)	G 44	XSN3 + 8S	Screw ⊕3×8
	QGK3201K	Side Board		"Silver Type"		G 45	XWA3B	Washer
	"Black Type"		1	QG01994Y	Operation Button (Stop)	1		
G 4	OBG1736	P.B Cushion		"Black Type"			ACC	ESSORIES
G 5	QGK3223D	Meter Cover	G 18	QGO1995	Push Button			
	"Silver Type"				(Counter Reset)	A 1	RP023A	Connection Cord
	OGK3223K	Meter Cover	G 19	QYF0542	Cassette Lid Assembly		QQT3266	Instruction Book
	"Black Type"			"Silver Type"				ca, Middle East and Africa
G 6	QGL1174	Filter		QYF0542K	Cassette Lid Assembly	areas.		
G 7 G 8	QYB0411 QYP1084	Button Cover Assembly		"Black Type"	Values Kash B		QQT3268	Instruction Book
G 8		Front Panel Assembly	G 20	QYT0636	Volume Knob-R	[For A	ustralia.]	
	"Silver Type" QYP1085	Front Panel Assembly		OVTODO	Not an Rock I			OKINOS
	"Black Type"	From Paner Assembly	G 21 G 22	QYT0637 QGT1569	Volume Knob-L Select Knob		PA	CKINGS
G 9	QGK3222B	Operation Bonel			Function Button	D 4	QPN4290	tanida Osatas
49	"Silver Type"	Operation Panel	G 23 G 24	QGO2043 QGO2042	Timer Buttom	P 1	QPN4290 QPA0654	Inside Carton Cushion-A
	QGK3222K	Operation Panel	G 25	QGO2042 QGO1900	Power Button	P 3	QPA0655	Cushion-B
	"Black Type"	Operation Faller	G 26	QMR1986	Power Rod	P 4	XZB50X65A02	Poly Bag
G 10	QKJ0518	Push Button Holder	G 27	QJC0049	Earth Plate-A	P 5	QPS0618	Pad
3 10	GINDUS 10	rush Button Holder	G 28	QTS1576	Meter Shield Plate	P6	QPC0072	Sheet
G 11	QXB0758	Operation Button (Play)	G 29	QKM1512	Main Case Assembly	P 7	QPA0662	Spacer
4 11	Q/D0130	operation button (riay)	G 29	GIVINIOIE	Main Case Assembly	1	G1 A0002	Opacei

## **ELECTRICAL PARTS LOCATION**

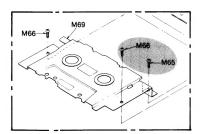


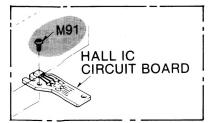
## **CABINET PARTS LOCATION**



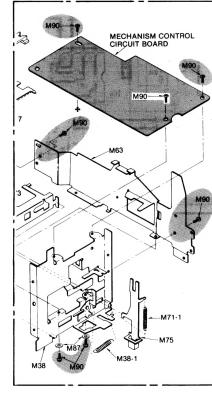
## **MECHANISM PARTS LOCATION** (DIFFERENCE)

#### **Front Side**

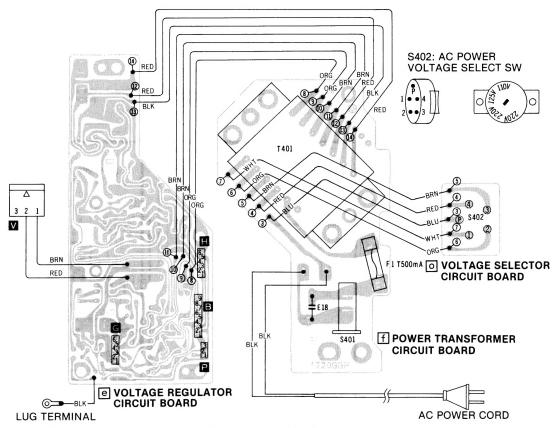




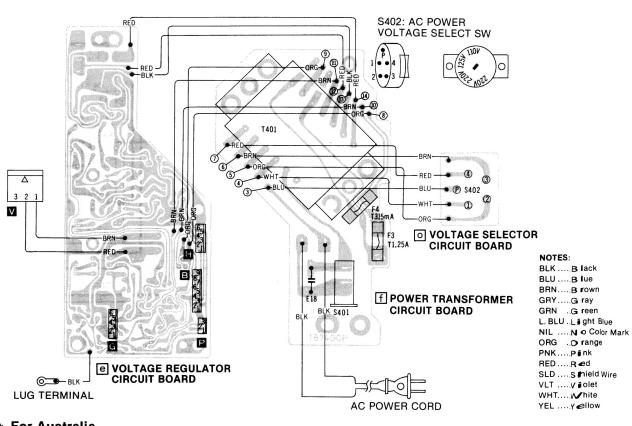
**Rear Side** 



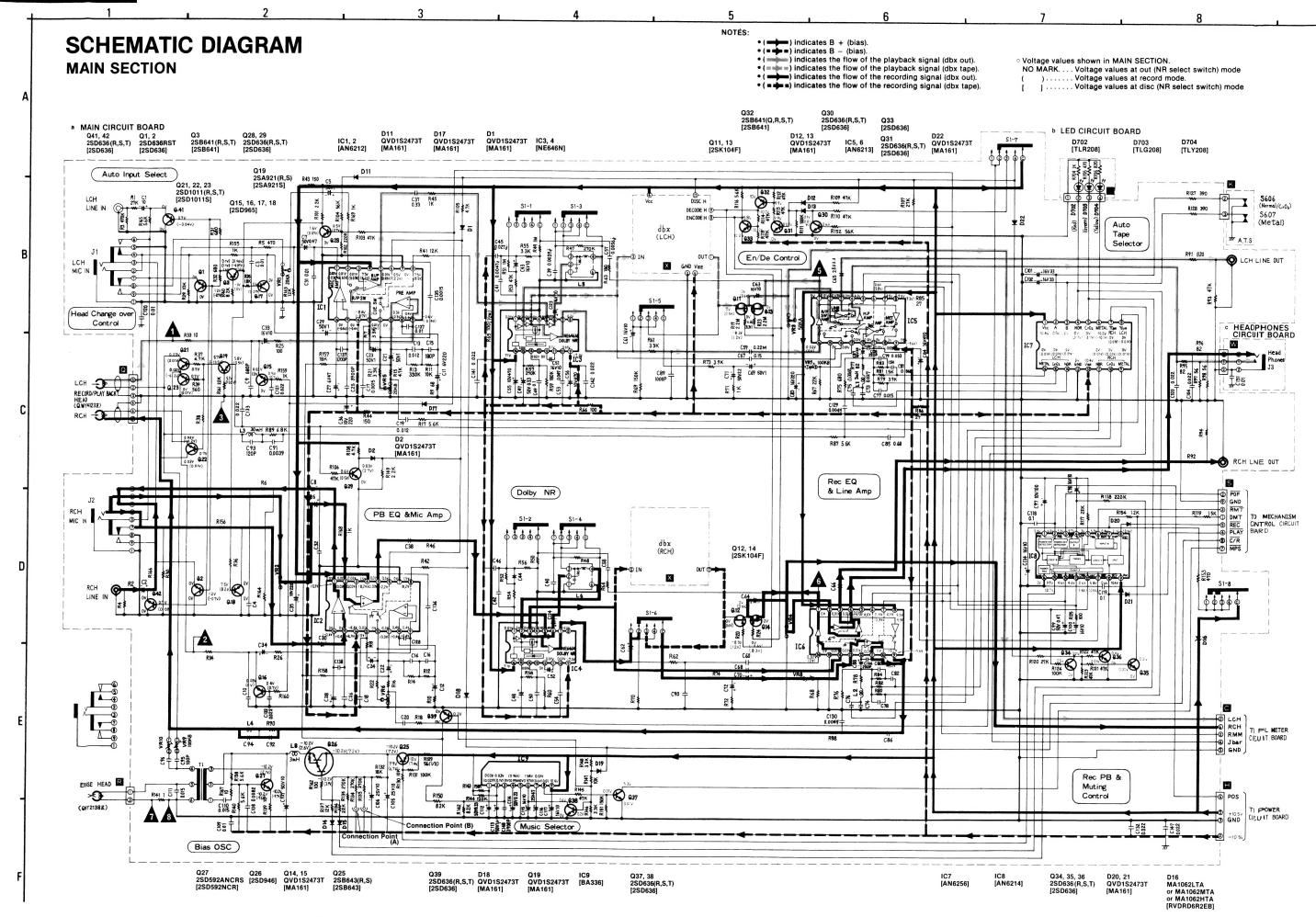
## WIRING CONNECTION DIAGRAM

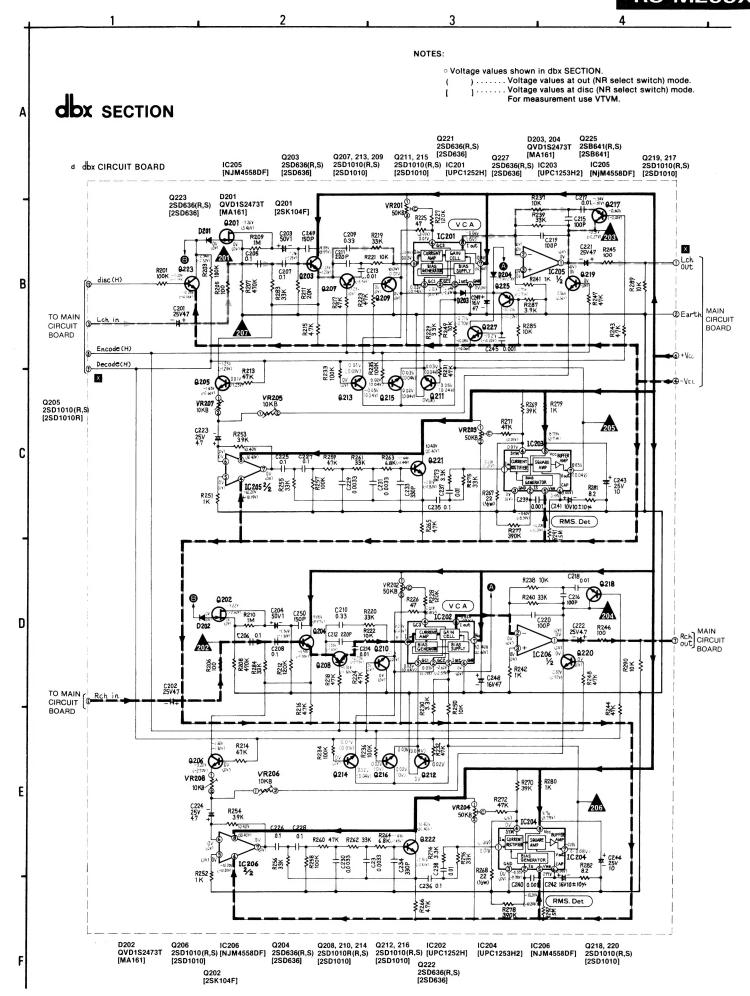


\* For Asia, Latin America, Middle East and Africa areas.

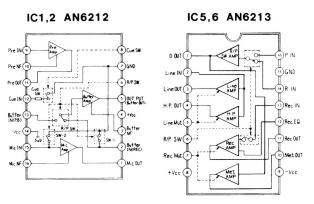


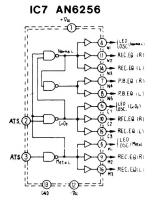
\* For Australia.

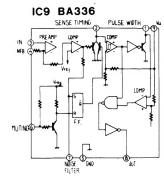




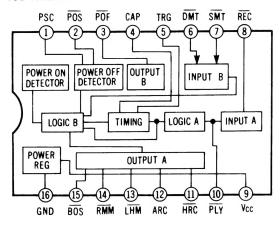
#### **EQUIVALENT CIRCUITS**







#### IC8 AN6214



#### ■ Truth table of IC1, 2 (Postive)

#### R/P SW

⑥pin	Operation
Н	REC
L	PB

#### SW-1, SW-2

⑥pin	Operation
Н	
L	Mute

Cue SW	
®pin	Operation
Н	
L	Cue

#### ■ Truth table of IC5, 6 (Positive)

#### R/P SW

⑥pin	Operation
Н	REC
L	PB

#### Muting

<b>⑤</b> ,⑦Pin	Operation
Н	Muting OFF
L	Muting ON

#### L : GND Level

#### \* Input level controls · · · MAX **SPECIFICATIONS** \* Output level control ··· MAX

<u> </u>	
Playback S/N ratio  * Test tape ··· QZZCFM	Greater than 45 dB
Overall distortion  * Test tape QZZCRA for Normal QZZCRX for CrO <sub>2</sub> QZZCRZ for Metal	Less than 4%
Overall S/N ratio  * Test tape ··· QZZCRA	Greater than 43 dB (without NAB filter)

NOTES:
• S1-1—S1-8 ...... NR select switch (shown in OUT position: (1) Dolby NR, (2) OUT, (3) dbx tape, (4) dbx disc)
. Auto tape select switch (For Normal/CrO<sub>2</sub> tape) • S606 . . . . . . . .

Auto tape select switch (For Metal tape)

Mode	S606	S607
Normal	on	on
CrO <sub>2</sub>	on	off
Metal	off	off

• VR1, 2	Input level controls.
• VR3, 4	Output level control.
• VR5, 6	Playback gain adjustment VR.

• VR7, 8. . . . . Recording gain adjustment VR. • VR9, 10. . . Bias current adjustment VR. • VR201, 202. VCA symmetry adjustment VR.

 VR203, 204. RMS detector adjustment VR. • VR205, 206. dbx standard level adjustment VR (Encode). VB207, 208. dbx standard level adjustment VR (Decode)

Pesistance are in ohms  $(\Omega)$ , 1/4 watt unless specified otherwise. 1K = 1,000  $(\Omega)$ , 1M = 1,000 k  $(\Omega)$ 

 Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.

• The mark (♥) shows test point. e.g. v = test point 1.

All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise

 Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.

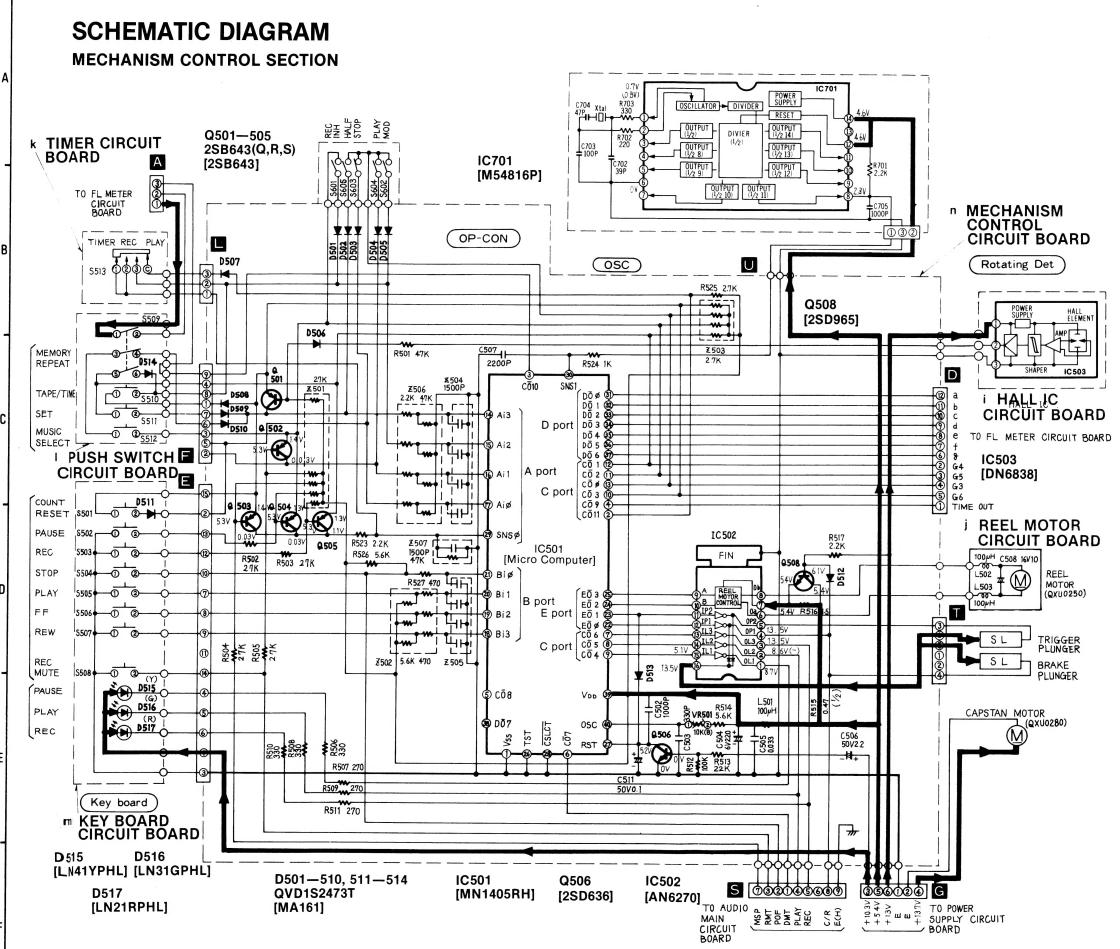
One type of number is used for supply parts number and production parts number when they are identical.

e.g. Q1 2SC1844 (E, F) ← Production parts number [2SC1844E] ← Supply parts number 1S2473T77 ← Production parts number.

[MA161] — Supply parts numbers

• The supply parts number is described alone in the replacement parts fist.

 This schematic diagram may be modified at any time with the development of new technology.



. Input scanning time adjustment VR

Counter reset switch • S502 . Pause switch

. Record switch

. Stop switch . Playback switch S504

• S506 . Fast Forward switch . Rewind switch

Record mute switch · S508 Memory repeat switch

· S510 Tape/Time select switch . Set switch

· \$512

Music select switch Timer switch (shown in REC position: (1) REC, (2) OFF, (3) PLAY)

• S601 . Accidental erase prevention switch • S602 . Mode switch

Mode sensing • S603. • S604. Stop switch

. Playback switch . Cassette detection switch

• Resistance are in ohms  $(\Omega)$ , 1/4 watt unless specified otherwise.  $1K = 1.000 (\Omega), 1M = 1.000 k(\Omega)$ 

• Capacity are in microfarads (µF) unless specified otherwise. P = Pico-farads

 The mark (▼) shows test point. e.g. ▼ = Test point 1.
 All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltae in record mode is indicated in ( ) when it differs from that in record mode.

For measurement, use VTVM.

• ( ) indicates B + (bias)

 Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts

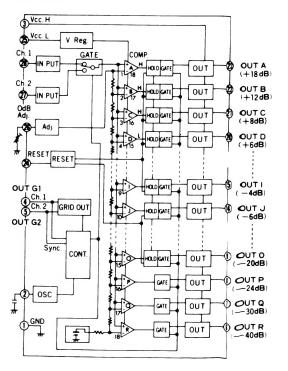
```
e.g. Q1
   [2SC1844E] 		─ Supply parts number
   QVD1S2473T ← Production parts number
```

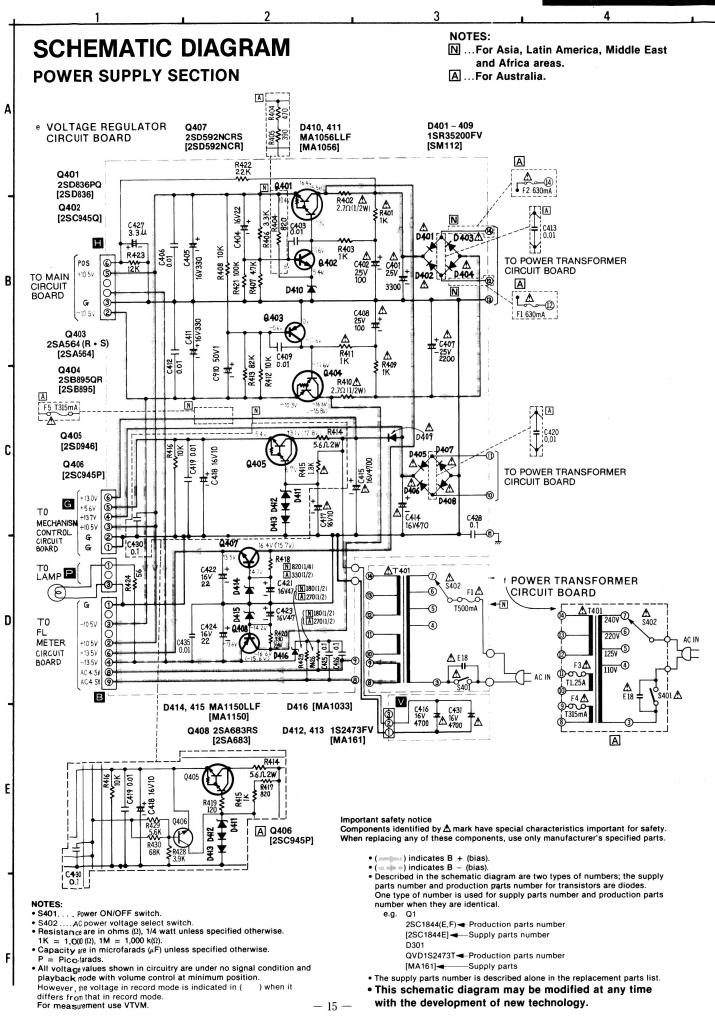
• The supply parts number is described alone in the replacement parts list

• This schematic diagram may be modified at any time with the development of new technology.

#### **EQUIVALENT CIRCUITS**

#### IC301 AN6870





**CIRCUIT BOARD VOLTAGE REGULATOR CIRCUIT BOARD** 

#### NOTES:

N ... For Asia, Latin America, Middle East

**TERMINATIONS** 

Q401

Q402, 403,

407, 408, 508

Q4O4, 405

D40 1 ~ 409

Ao -→ Ca

D4 10, 411

4A

D41 4, 415

lo ► Ca

D416

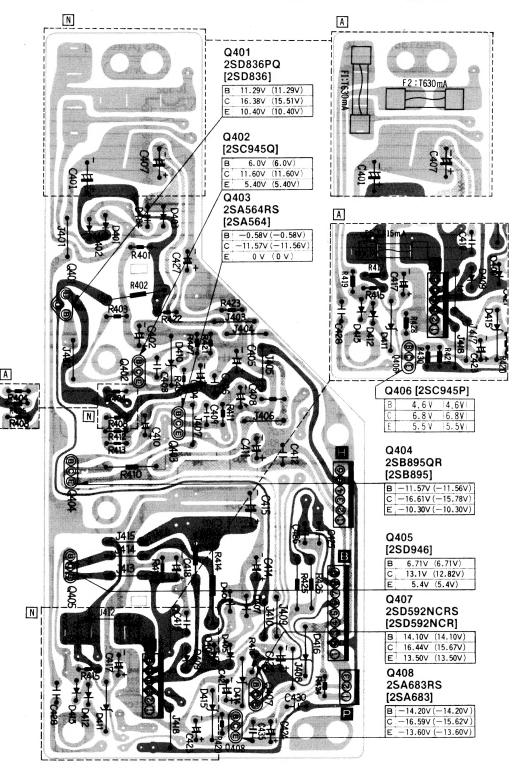
Ca 👈

Brown

Ca →

Green

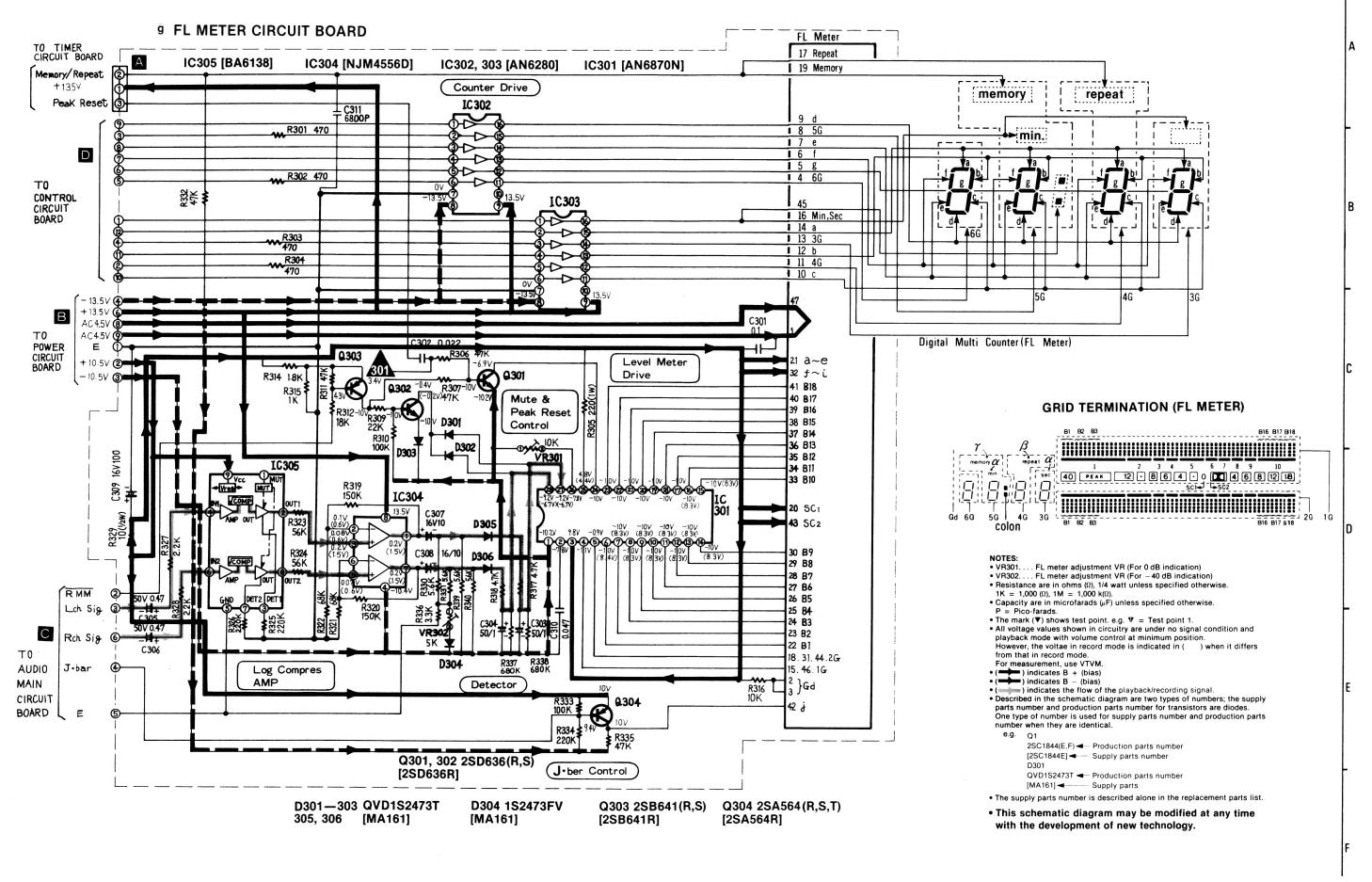
- and Africa areas.
- A...For Australia.



- The circuit shown in on the conductor is B + (bias) circuit.
  The circuit shown in on the conductor is B- (bias)circuit.
- The circuit shown in some on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in \_\_\_\_\_ are DC voltage between the ground and electrical parts.
- The voltage indicates are measured during playback mode However, the voltage in record mode is indicates in ( ) when it differs from that
- This circuit board diagram may be modified at any time with the development of new technology.



#### **FL METER SECTION**



# Service Manual

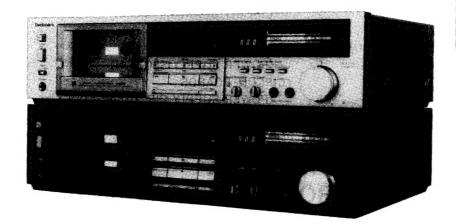
Cassette Deck

**RS-M255X** 

**dbx** Equipped Cassette Deck with Electronic Multi-Mode Counter

(Silver Face)
Black Face





This is the Service Manual for the following areas.

D ······· For all European areas except United Kingdom.

B ..... For United Kingdom.

#### **RS-M250 MECHANISM SERIES**

## **Specifications**

Track system: 4-track 2-channel stereo recording and playback

Tape speed: 4.8 cm/s

Wow and flutter: 0.038 % (WRMS),  $\pm$  0.13 % (DIN)

Frequency response: Metal tape; 20 – 20,000 Hz

25 - 18,000 Hz (DIN)

30-17,000 Hz  $\pm 3$  dB

CrO<sub>2</sub> tape; 20-19,000 Hz

25 — 18,000 Hz (DIN)

 $30-16,000 \, \text{Hz} \pm 3 \, \text{dB}$ 

Normal tape: 20 - 18,000 Hz

25-16,000 Hz (DIN)

 $30 - 15.000 \, \text{Hz} \pm 3 \, \text{dB}$ 

Dynamic range:

110 dB (at 1 kHz) with dbx in

Max. input level

improvement: 10 dB or more improved with dbx in (at 1 kHz)

Signal-to-noise ratio: dbx\*in; 92 dB

Dolby NR in; 68 dB (above 5 kHz)

Dolby NR out; 58 dB (signal level = max. input

level A weighted, CrO2 type tape)

Fast forward and

Outputs:

rewind time: Approx. 90 seconds with C-60 cassette tape

Inputs: MIC; sensitivity 0.25 mV, applicable microphone

impedance  $400\Omega - 10 \,\mathrm{k}\Omega$ 

LINE; sensitivity 60 mV, input impedance  $47 \text{ k}\Omega$  LINE; output level 700 mV, load impedance  $22 \text{ k}\Omega$ 

ove

HEADPHONES; output level  $125\,\text{mV}$  (at  $8\Omega$ )

Bias frequency: 85 kHz

Motor: 2-motor system

Heads: 2-head system

1-SX (Sendust Extra) head for record/playback

1-double-gap ferrite head for erasure

Power requirement: AC; 110/125/220/240 V, 50-60 Hz

Pre-set power voltage 220 V 240 V for United Kingdom

Power consumption: 28 W

Dimensions:  $43.0 \text{cm}(W) \times 10.8 \text{cm}(H) \times 33.1 \text{cm}(D)$ 

Weight: 6.0 kg

Specifications are subject to change without notice. 
\* The term dbx is a registered trademark of dbx Inc.

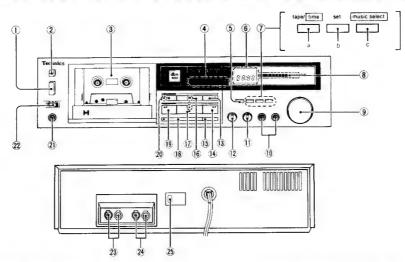
\*\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

# **Technics**

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## **LOCATION OF CONTROLS AND COMPONENTS**



- 1 Power switch [power (push on)]
- 2 Eject button [eject]
- 3 Cassette holder
- Tape indicator

[Auto Tape Select (Normal • CrO<sub>2</sub> • Metal)]

- ⑤ Memory repeat button [memory repeat (♣ off – on)]
- 6 Digital multi counter [multi counter]
- ① Counter mode select button [multi counter mode]
  - (a) Tape/time select button [tape/ time]
  - **b** Set button [set]
  - © Music select button [music select]
- 8 FL (fluorescent level) meter
- ⑨ Input level controls [input level (L → R)]
- 10 Microphone jacks [mic (L R)]
- 1 Output level control [output level]
- 12 Noise reduction select switch

[Noise Reduction (Dolby NR • out • dbx tape dbx disc)]

- (3) Record muting button (rec mute (O))
- (♣) Fast forward button [ff (M S) (►►)]
- (5) Counter reset button [counter reset]
- (6) Pause button and indicator [pause (11)]
- Play button and indicator [play ( ▶ )]
- (® Stop button [stop ( )]
- (19) Rewind button [rew (M · S) ( ◀ ◀ )]
- 20 Record button and indicator [rec (O)]
- 21 Headphones jack [phones]
- 2 Timer start switch [ timer (rec off play)]
- 23 Line output jacks [LINE OUT (R L)]
- 24 Line input jacks [LINE IN (R L)]
- 25 Voltage selector [VOLTAGE SELECTOR]

## **OPERATING INSTRUCTION**

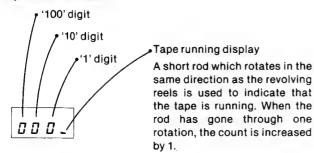
#### Digital multi counter

The Digital multi counter can be used in combination with the memory repeat, music select, record muting and pause functions.

#### (1) Using it as a tape counter

The 3-digit digital counter featured in this unit displays a count which is virtually identical to that of Technics' mechanical counter. With a C-60 tape, the count reaches about 400, with a C-90 tape about 600 and with a C-120 tape about 800. The tape counter is employed to read out the tape position by means of the counter figures and so program search can be performed easily.

#### Tape counter readout



#### Setting to "@@@"

- When the Power switch is pushed and the power switched on, the counter is reset to """.
- When other displays appear on the Digital multi counter, set to "GBG" in the sequence given in the table below.

Present display	"DDD" setting procedure
Tape counter	Depress the Counter reset button
Remaining time counter	Depress the Tape/time select button.     Depress the Counter reset button.
Skipping programs	1. Depress the Music select button. 2. When the time display appears, depress the Tapel time select button and switch over to the tape counter display. 3. Depress the Counter reset button

#### (2) Displaying the remaining tape time

The remaining time on the tape is displayed by setting the time at the beginning of the tape in accordance with the length of the tape, and while the tape is running in the recording mode, the time is counted down.

A 30-minute recording can be made on one side with a C-60 tape. When the remaining time counter is set to "30:00" at the beginning of the tape and recording commenced, the counter will show how many minutes of recording are left on the side of the tape being recorded.

#### Operate as follows:

- 1. Prepare to operate
  - Depress the Stop button and stop the tape at its beginning.
  - Set the Memory repeat button to the "off" position.

When the counter is functioning as a tape counter or is displaying a different indication, change over to the remaining time counter display in the sequence given in the table below.

Present display	Procedure for selection
Tape counter	Depress the Tape/time select button.
Skipping programs	Depress the Music select button.     When the tape counter display appears, depress the Tape/time select button.

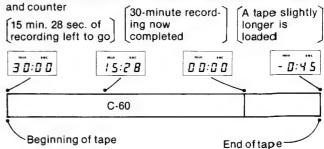
3. Set the time in accordance with the tape length. Every time the Set button is depressed, the counter goes through the following indications: "15:00", "23:00", "30:00", "45:00" and "50:00". Set the time in accordance with the tape length, referring to the table below.

Tape length	Set time	One-side recording time (min.)
C — 30	15:00	15
C — 46	2 3:0 0	23
C — 60	3 0:0 0	30
C — 90	4 5:0 O	45
C — 120	5 D:D D	60

\* Some tapes with a non-standard length are sold. When using one of these, set the time to the closest value in the above table.

#### 4. Start the recording

The tape runs and as the amount of tape remaining decreases, the time indicated on the counter also decreases. The figure below shows the relationship between the tape



#### Notes:

- Do not depress the Fast forward or Rewind button while the remaining tape time is being displayed. This action will cause the counter to function as a tape counter and make it unable to display the correct remaining tape time.
- If the Tape/time select button is depressed when changing over to the remaining time counter, "!2:34" or "-B: B2" will be displayed. This is not the remaining tape time display.

To find out the precise remaining tape time, it is n ecessary for the time to be set at the beginning of the tape.

#### (3) Displaying the record muting time

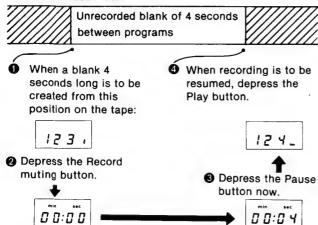
When the Record muting button is depressed during recording, the Digital multi counter starts counting each passing second and no sound is recorded on the tape.

The function can be used to created unrecorded blanks on

## RS-M255X

the tape of the required length. Blanks of about 4 seconds are required for the music selector to work accurately.

 Given below is the procedure for creating unrecorded blanks of 4 seconds.



#### (4) Skipping programs

It is possible to skip up to 20 programs.

Operate as follows:

- 1. Prepare to operate.
  - · Set the Memory repeat button to the "off" position.
  - Depress the Music select button and make the Digital multi counter indicate "pp".

4 seconds have elapsed.

- 2. Set the number of programs to be skipped.
  - Every time the Set button is depressed, the number increases by 1. Set to the desired number.
  - To reset the number of programs to be skipped (for instance, "a3" has been set although "a2" was initially desired), depress the Music select button twice to make the counter display "a2", and then depress the Set button to set the desired number.
- 3. Depress the Fast forward or Rewind button.
  - Playback starts automatically as soon as the tape reaches the start of the required program.
  - The digital multi counter display decreases by 1 every time a gap between programs is detected, and when playback begins, it changes over to the tape counter function.

#### Notes:

 The number of programs to be skipped can be set in either the stop or playback mode.

When the Pause or Stop button is depressed immediately after the setting has been made in the playback mode, the setting is released.

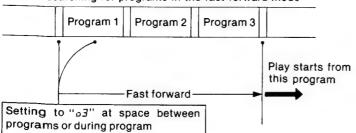
When the Pause or Play button is depressed immediately after the setting has been made in the stop mode, the setting may be released.

 When the Stop or Play button is depressed when searching for a program, the skipping program search mode is released.

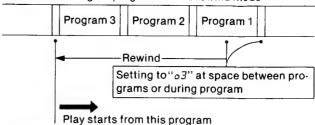
#### Counting the number of programs to be skipped

#### ■ When "□3" has been set

When searching for programs in the fast forward mode



· When searching for programs in the rewind mode



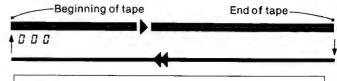
■ When "oo" has been set

- When the tape is fast forwarded, playback will begin from the program following that now heard.
- When the tape is rewound, playback will begin from the start of the program now heard.

#### (5) Memory repeat playback

#### When playing back the whole tape repeatedly

- 1. Set the tape counter to "GDD" at the position corresponding to the beginning of the tape.
- 2. Set the Memory repeat button to the "on" position.
- Depress the Play button and make the tape run.
   When the tape comes to the end, it is rewound automatically and playback begins again automatically from the beginning. This operation is continued 16 times unless the Stop button is depressed.

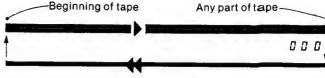


#### Note:

• Since "DDD" is detected at the end of the tape, the number of repeats may be reduced to a minimum of 8, depending on the state of the tape.

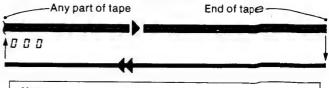
## Repeat playback from tape beginning to program somewhere on tape

- Set the tape counter to "GOO" at the position where the program whose play is to be repeated ends.
- 2. Rewind the tape to the beginning.
- 3. Set the Memory repeat button to the "on" position.
- 4. Depress the Play button and make the tape run. The tape is rewound automatically to the "פּפּפּ" display and the same playback operation as above is repeated automatically for 16 times.



## Repeat playback from a program somewhere on tape to tape end

- 1. Set the tape counter to "@@@" at the position where the start of the program is located.
- 2. Set the Memory repeat button to the "on" position.
- 3. Depress the Play button and make the tape run. The tape is automatically rewound at the end of the tape and the part of the tape from the "DDD" display to the end is played back repeatedly 16 times automatically.



#### Note:

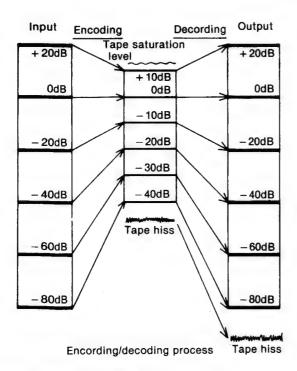
 Always set the Memory repeat button to the "off" position after use.

#### dbx noise reduction system Features

- Reduced noise over the whole audible frequency range (more than about "30dB" reduction).
- The signal is compressed at a high recording level for recording to enable recording with minimal distortion and a wide dynamic range.
- The linear logarithmic compression and expansion do not make the sound quality undergo change with level mismatching.

#### Principle of basic operation

The dbx system works to expand the dynamic range by compressing (encoding) the signals and then expanding (decoding) them. As shown in the figure, the input signal level is halved during recording onto the tape. During playback the halved level is doubled to restore the original signal. The figure shows that high signals are greatly expanded (from "+10 dB" to "+20 dB") while low signals are given a low expansion ("-40dB" to "-80dB"). This results in a great improvement in the dynamic range and simultaneously in a great reduction in tape hiss.



#### "disc" position for "dbx encoded discs"

This unit comes with a "dbx disc" position on the Noise reduction select switch for playing "dbx encoded discs."

#### Playing "dbx encoded discs"

Operate in the following sequence:

- 1. Set the input selector on the stereo amplifier to the "tape" position and the record selector to the "phono" position. If the amplifier is capable of tape monitor selection, set the tape monitor switch to the "tape" position and the input selector to the "phono" position.
- Set the unit to the stop mode and then set the Noise reduction select switch to the "dbx disc" position.
   Disconnect the microphone if one has been connected to the unit

- 3. Start operating the turntable.
- 4. Adjust the unit's Input level controls so that the Fluorescent level meter illumination indicates around "0 dB".
- Adjust the volume using the control on the stereo amplifier.

#### Note:

 Do not set the Noise reduction select switch to the "dbx disc" position during tape playback since the sound will then no longer be heard.

Some open-reel type dbx encoded tapes are now available from music stores. These tapes can be played back just like the records by setting the Noise reduction select switch to the "disc" position.

#### Recording "dbx encoded discs" onto tape

- Set the Noise reduction select switch to the "dbx disc position."
- Adjust the recording level, following the "Recording level setting" instructions.
- 3. Start the recording.

The sound of the disc is recorded on the tape still in encoded (compressed) form. The decoded (expanded) sound can, however, be monitored (through both the speakers connected to the amplifier and headphones connected to the unit). When playing back a tape which has been recorded in this way, set the Noise reduction select switch to the "dbx tape" position.

\* Unlike ordinary records, "dbx encoded discs" have their sound dbx encoded (compressed) when it is cut into the sound grooves. This means that for replay, the sound must be returned to its original form through a decoder (expander). As a result, the noise level is reduced and the dynamic range is increased for a higher record play quality.

#### Recording with Dolby NR

This unit includes the Dolby NR system, which reduces tape noise to a remarkable degree.

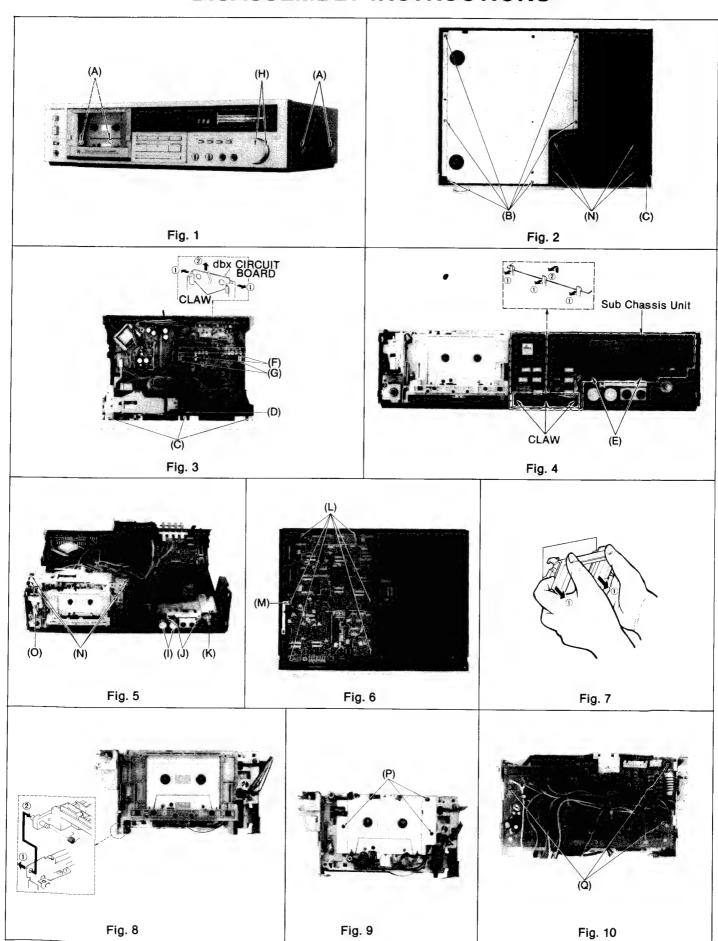
Briefly, the system works as follows: At low sound levels (where tape noise is most noticeable), the high-frequency portion of the sound is recorded at a higher level. Tape noise is not amplified.

During playback, the level of only that portion of the signal which was increased at the time of the recording, as well as tape noise, is reduced by a like amount. This causes the signal to be heard at a normal level, and the tape noise to be reduced significantly.

#### Noise reduction select switch

- dbx tape: Used for dbx recording and for replaying dbx recorded tapes.
- dbx disc: Used for playing dbx encoded discs on a turntable and for recording such discs.
- Dolby NR: Used for recording with the Dolby NR system and replaying tapes which have been recorded with the Dolby NR system.
- Out: Used when noise reduction is not required.

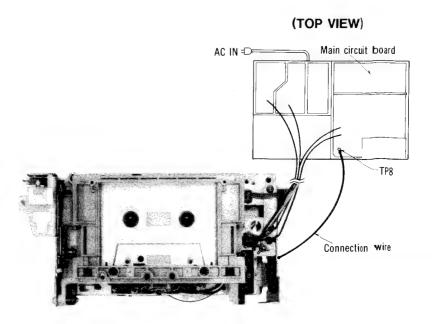
## **DISASSEMBLY INSTRUCTIONS**



Ref. No.	Procedure	To remove —— .	Remove ——.	Shown in fig. ——.
1	1	Case cover	• 4 screws(A)	1
2	2	Bottom cover	• 6 screws(B)	2
3	1→2→3	Front panel	• 4 screws(C)	2, 3
4	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$	Sub chassis unit	• 1 screw(D)	3
5	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5$	Push switch circuit board	• 2 screws ·····(E)	4
6	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 6$	Key board circuit board	• As shown in fig. 4, pull the claw in the direction of arrow ①, the pull key board circuit board in the direction of arrow ②.  Then, it can be removed.	4
			• 2 red screws(F)	3
7	1→7	dbx circuit board	dbx P.B. holder	3
8	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 7 \rightarrow 8$	Main circuit board	2 volume knobs	1 5 5 5 6 6
9	1-2-3-4-9	Mechanism unit	• 8 screws	2. 5 5
10	10	Cassette lid	As shown in fig. 7, pull in the direction of arrow ①.  Then, it can be removed.	7
11	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 9 \rightarrow 10$ $\rightarrow 11$	Cassette holder	While pushing mechanical chassis in the direction of arrow ①, extract cassette holder in the direction of arrow ②.	8
12	$ \begin{array}{c} 1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 9 \rightarrow 10 \\ \rightarrow 11 \rightarrow 12 \end{array} $	Mechanism cover	• 3 screws(P)	9
13	$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 9 \rightarrow 13$	Main control circuit board	• 3 screws(Q)	10

#### MECHANISM SECTION

- 1. For repair, measurement or adjustment with the mechanism removed from the unit be sure to ground the lower base plate of the mechanism.
- 2. For grounding, connect a extension cord to the mechanism's lower base plate and TP8 (earth) from main circuit board.
- 3. Without grounding, the auto tape selector does not operate properly.

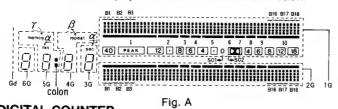


## **TECHNICHAL EXPLANATION**

#### DISPLAY SECTION

#### 1. DISPLAY TUBE

Internal display-tube connections are shown below



Each segment has a triode configuration (See fig. B).



NOTES:

Fig. B

Anode: 1-10, (a)—(g), B1—B18,  $\alpha$ —  $\gamma$ , colon

Grid: 1G-6G, Gd

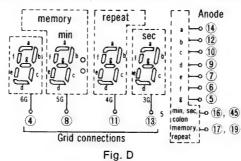
#### 2. DIGITAL COUNTER

1. During tape counter indication, tape count is displayed by the first three digits (6G, 5G, 4G). The bottom digit (fig. C) is used to indicate tape travel and direction as one of the segments (c), (d), (e) and (g) lights (counterclockwise ration for PLAY and FF; clockwise for REW).



Fig. C

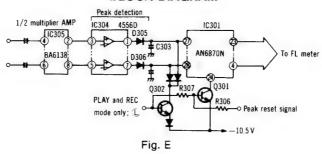
- 2. For tape remaining time indication, all four digits and ":", "min" and "sec" are used. For recording muting time indication, display elements are the same.
- 3. Only lower two digits are used to indicate music selection (for jumping up to 20 selections). These functions of the digital counter are controlled by outputs from the microprocessor IC501 via FL driver IC302 and IC303.



#### 3. LEVEL METER

This model uses a level meter IC AN6870N for dynamic lighting indication, featuring a wide range of  $-40\,\mathrm{dB}$  to  $+18\,\mathrm{dB}$  range.

#### **BLOCK DIAGRAM**



#### CIRCUIT OPERATION

Most conventional level meters using AN6870 (IC301) can only display levels in the range of  $-20\,\mathrm{dB}$  to  $+8\,\mathrm{dB}$ . RS-M255X using the same AN6870, however, is capable of covering a range of  $-40\,\mathrm{dB}$  to  $+18\,\mathrm{dB}$ , which is sufficient for the expanded dynamic range of dbx.

A conventional peak meter circuit follows the IC304, which means a limited display range between  $-20\,\mathrm{dB}$  and  $+8\,\mathrm{dB}$ . To offset this, a 1/2 multiplier circuit is added to the pre-stage to double the display range.

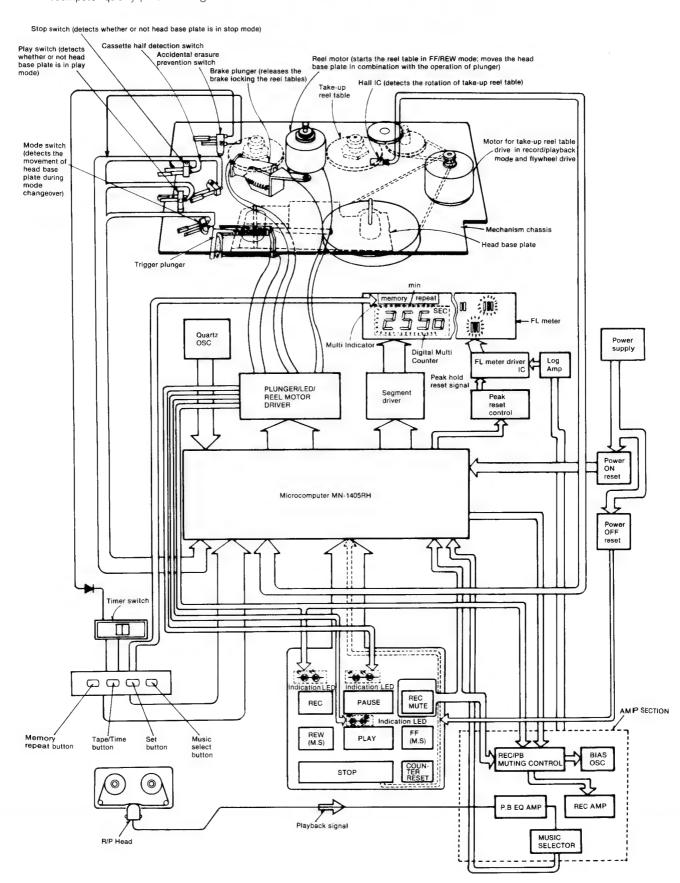
In other words, the dynamic range (58dB) of the input signal to IC305 (BA6138) is compressed to approximately half (multiplied by 1/2) to obtain a 28dB dynamic range for the signal to the meter circuit.

Sound signal (AC signal) is inputted to this IC, which outputs a DC signal converted to half of the input.

Lavel meter indication	Changes in termina	LINE OUT	
Level meter indication	Pin ④ or ⑥	Pin <b>②</b> or <b>®</b>	LINE OUT voltage
+12dB	+12dB +12dB		+ 12 dB (1600 mV)
0 dB	0 dB	0 dB	0 dB (400 mV)
−12dB	−12 dB	around -6dB	-12dB (100mV)

#### CONTROL SECTION

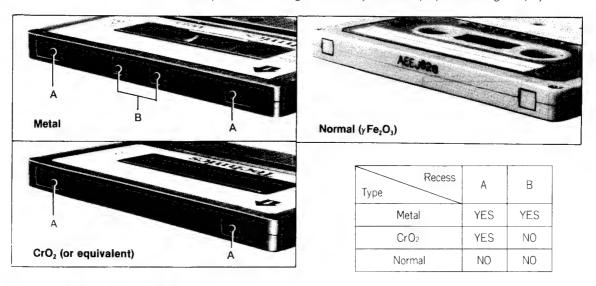
RS-M255X contains a microcomputer MN1405RH for various input control buttons, rotation detection, and operation commands. The microcomputer quickly processes signals received from the 19 control switches and a hall IC.



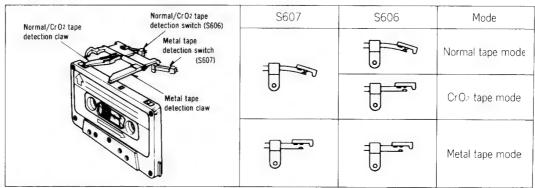
#### AUTO TAPE SELECTOR

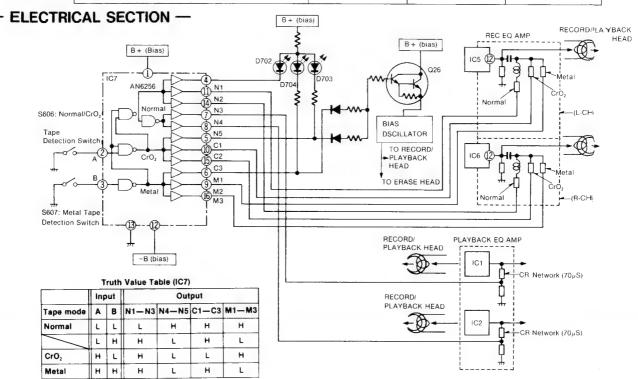
This unit is equipped with an auto-tape selector system that detects these identification recesses and automatically selects the correct bias and equalization for Normal, CrO<sub>2</sub> and Metal tape varieties.

Thus, the novice user can obtain the correct tape selector setting automatically to ensure proper recording and playback results.



#### - MECHANICAL SECTION -





## **MEASUREMENT & ADJUSTMENT METHODS**

#### Tape selector (Tape mode switching)

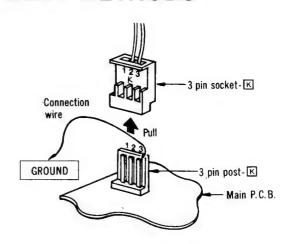
For measurement adjustment with test tapes without tape detection holes (A and B), switch tape modes as follows. (For normal tape mode, just insert a normal tape into the cassette holder.)

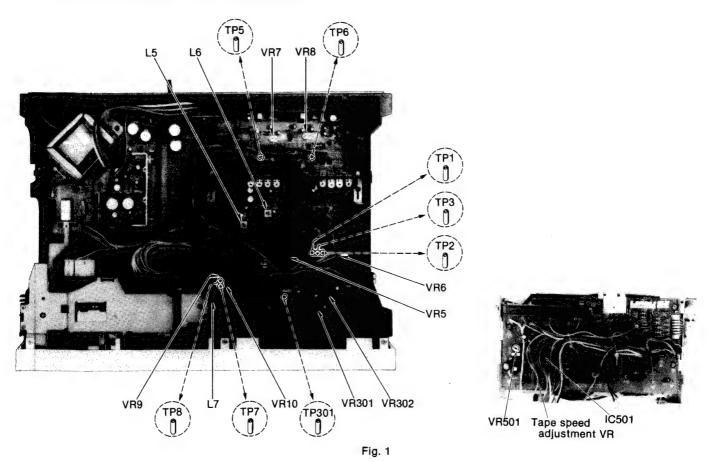
#### \* Metal tape mode setting:

Metal tape mode is obtained by disconnecting the 3 pin socket **ເ** from the 3 pin post **ເ** on the P.C.B. (Printed Circuit Board).

#### \* CrO<sub>2</sub> tape mode setting:

First, disconnect the 3 pin socket 🗵 in the same way as above. Then, as illustrated in the figure right, connect the terminal-3 of the 3 pin post to the ground with a connection wire.





NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- NR switch: OUT

- Timer start switch: OFF
- Input level controls: Maximum
- Out put level control: Maximum

ITEM	MEASUREMENT & ADJUSTMENT		
Head azimuth     adjustment Condition:     Playback mode	L-CH/R-CH output balance adjustment  1. Make connections as shown in fig. 2.	Record/playback head  Playback mode  Pig. 2	

#### **ITEM MEASUREMENT & ADJUSTMENT** Equipment: 2. Playback the 8kHz signal from the test tape \* VTVM \* Oscilloscope (QZZCFM). Record/playback head \* Test tape (azimuth) Adjust screw (B) in fig. 3 for maximum output L-CH ··· QZZCFM and R-CH levels When the output levels of L-CH and R-CH are not at maximum at the same time, readjust as follows. 3. Turn the screw shown in fig. 3 to find angles A and C Fig. 3 (points where peak output levels for left and right channels are obtained). Then, locate the angle B between angles A L-CH peak level and C, i.e., a point where L-CH and R-CH output levels come together at maximum. (Refer to figs. 3 and 4.) OUTPUT LEVEL L-CH/R-CH phase adjustment 4. Make connections as shown in fig. 5. 5. Playback the 8kHz signal from the test tape (QZZCFM). ANGLE c A B Adjust screw (B) shown in fig. 3 so that pointers of the two Fig. 4 VTVMs swing to maximum and a waveform as illustrated in fig. 6 is obtained on the oscilloscope. playback head 7 Playback LINE OUT Fig. 6 Vertical Horizon Fig. 5 Tape speed Tape speed accuracy Condition: 1. Test equipment connection is shown in fig. 7. 2. Playback test tape (QZZCWAT 3,000 Hz), and supply \* Playback mode Record/playback head ПП \* Normal tape mode playback signal to frequency counter. Measure this frequency. O Equipment: 4. On the basis of 3,000 Hz, determine value by following Test tape \* Digital electronic counter formula: \* Test tape · · · QZZCWAT Tape speed accuracy = $\frac{f - 3,000}{2000} \times 100$ (%) Fig. 7 3.000 where, f = measured value 5. Take measurement at middle section of tape. Standard value: ±1.5% Adjustment method 1. Playback the test tape (middle). Adjust so that frequency becomes 3,000 Hz. Tape speed adjustment VR shown in fig. 1. Tape speed fluctuation Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows: Tape speed fluctuation = $\frac{f_1 - f_2}{3.000} \times 1000$ (%) 3.000 $f_1 = maximum value, f_2 = minimum value$ Standard value: Less than 1.0% 1. Test equipment connection is shown in Playback frequency Playback frequency response chart response fig. 2. Place UNIT into playback mode. Condition: +6 dB Playback the frequency response test \* Playback mode +4d8 +4 dB tape (QZZCFM). \* Normal tape mode +2 dB +2 dB Measure output level at 12.5 kHz, 8 kHz, 0 dB 0dB Equipment: 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, -2 dB -2 dB \* VTVM \* Oscilloscope and compare each output level with the -4 dB -**\$** d₿ \* Test tape ··· QZZCFM standard frequency 315 Hz, at LINE OUT. -6 dB 5. Make measurement for both channels. 0 Hz / 500 Hz 1 kHz 2 kHz, 315 Hz 400 Hz 3 kHz 63 Hz 100 Hz 200 Hz # 2 kHz/ /6 kHz 12.5 3 kHz / 6 kHz 10 kH 4 kHz 5 kHz 7 kHz 8kHz 6. Make sure that the measured value is within the range specified in the frequency

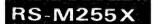
Fig. 8

response chart. (Shown in fig. 8.)

#### **MEASUREMENT & ADJUSTMENT ITEM** 1. Test equipment connection is shown in fig. 2. Playback gain 2. Playback standard recording level portion on test tape (QZZCFM 315 Hz, 0 dB), and using VTVM Condition measure the output level at LINE OUT jack. \* Playback mode 3. Make measurement for both channels. \* Normal tape mode Equipment: Standard value: 0.7V±1dB \* VTVM Oscilloscope (around 0.42V: at test points TP5 (L-CH) and TP6 (R-CH)) \* Test tape · · · QZZCFM Adjustment 1. If measured value is not within standard, adjust VR5 (L-CH), VR6 (R-CH) (shown in fig. 1). 2. After adjustment, check "Playback frequency response" again. Test equipment connection is shown in fig. 9. Erase current Place UNIT into metal tape mode. Condition: Erase head Press the record and pause buttons. \* Record mode Œ 4. Read voltage on VTVM and calculate erase current by \* Metal tape mode following formula: Erase current (A) = Voltage across both ends of R141 Equipment: \* VTVM Oscilloscope $1(\Omega)$ VTVM Oscilloscope Fig. 9 Standard value: 155±15 mA (Metal position) 5. If measured value is not within standard, adjust as follows. Adjustment 1. Open the point (B) and short the point (A) on the main circuit board in the circuit board diagram (See page 41). 2. Make measurement for erase current. 3. Make sure that the measured value is within the erase current of 140 mA to 170 mA. 4. If it is beyond the value, carry out the following adjustments: • If the erase current is less than 140 mA, open the point (A) • If the erase current is more than 170 mA, short the points (A) and (B). Note: Overall frequency Overall frequency response chart (Normal) response Before measuring and adjusting, make sure of the playback frequency response (For +6dB Condition: +4dB the method of measurement, please refer +4 dB \* Record/playback mode +2dB + 24R to the playback frequency response). \* Normal tape mode 0 dB 0 dB \* CrO<sub>2</sub> tape mode Overall frequency response adjustment -2 dB -2dB \* Metal tape mode - 4 dB by recording bias current -4 dB \* Input level controls ··· MAX -6dB -6 dB 50 Hz/ 100 Hz/ /500 Hz/ 1 kHz 2 kHz/ /6 kHz 800 Hz 200 Hz /400 Hz 70 Hz 300 Hz 600 Hz 700 Hz 4 kHz 5 kHz 7 kHz \* Out put level control · · · MAX (Recording equalizer is fixed) Equipment: 1. Make connections as shown in fig. 11. \* VTVM \* AF oscillator 2. Place UNIT into normal tape mode and Fig. 10 \* ATT \* Oscilloscope load the test tape (QZZCRA). \* Resistor (600 Ω) 3. Input a 1kHz, -24dB signal through \* Test tape LINE IN (reference blank tape) Place the set in record mode. VR13(L-CH) ... QZZCRA for Normal VR14(R-CH) 000 4. Fine adjust the attenuator to obtain Record /playback ... QZZCRX for CrO2 0.7 V LINE OUT output. head ··· QZZCRZ for Metal \* Make sure that the input signal level TP1 (L-CH) is $-24\pm4\,dB$ with 0.7V output Playback / LINE OUT record mode voltage. R33 (L-CH) 5. Adjust the attenuator to reduce the input R34 (R-CH) o. $|\langle \cdot \rangle|$ signal level by 20 dB. Oscilloscope 6. Adjust the AF oscillator to generate 50 Hz, VTVM Oscillosco For overall frequency 100 Hz. 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz and 10 kHz signals, and record For bias current these signals on the test tape. 7. Playback the signals recorded in step 6, Fig. 11 and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (If the curve is within the charted specifications, proceed to steps 8, 9, 10 and 11.) If the curve is not within the charted specifications, adjust as follows;

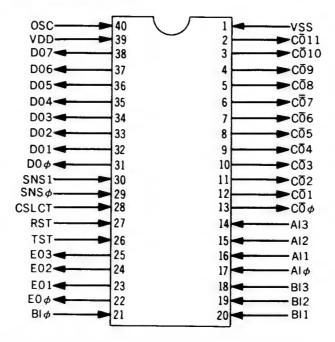
#### ITEM **MEASUREMENT & ADJUSTMENT** Adjustment (A): Adjustment ®: When the curve exceeds the overall frequency When the curve falls below the overall frequency response chart specifications (fig. 10) as shown response chart specifications (fig. 10) as shown in fig. 12. in fig. 13. + 4 dB +2dB -4 dB -4 dB -10 kHz HZ / 6 KHZ 9 KH 4 KHZ 5 KHZ 7 KHZ 8 KHZ HZ//6KHZ\\\9kHZ kHz5kHz 7kHz 8kHz Fig. 12 Fig. 13 1) Increase bias current by turning VR9 (L-CH) 1) Reduce bias current by turning VR9 (L-CH)) and VR10 (R-CH). and VR10 (R-CH) 2) Repeat steps 6 and 7 to confirm. (See fig. 1 on page 11.) 2) Repeat steps 6 and 7 to confirm. (Proceed to steps 8, 9, 10 and 11 if the (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specificacurve is now within the charted specifications-in fig. 10.) tions is fig. 10.) 3) If the curve still falls below the charted 3) If the curve still exceeds the specifications specifications (fig. 10), reduce bias current (fig. 10), increase bias current further and further and repeat steps 6 and 7. repeat steps 6 and 7. 8. Place UNIT into CrO2 tape mode. 9. Change test tape to QZZCRX, and Overall frequency response chart(CrO2, Metal) record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1kHz, 4kHz, 8kHz, 10kHz and 12.5kHz +6dB signals. Then, playback the signals and +5dB +4dB +4 dB check if the curve is within the limits +2 dB +2dB shown in the overall frequency response 0 dB OdB -2 dB -- 2 dB chart for CrO<sub>2</sub> tapes (fig. 14). -4 dE 10. Place UNIT into metal tape mode change -4 dR -6 dB test tape to QZZCRZ, and record 50 Hz. 50 Hz / / (100 Hz / 300 Hz ) / 60 Hz / / 90 Hz 200 Hz / 500 Hz 70 Hz 80 Hz 400 Hz 60 1 kHz 2 500 Hz 1 3 kHz 1 10 kHz 500 Hz 1 800 Hz 2 4 kHz 16 kHz 2 kkHz 400 Hz 600 Hz 700 Hz 2 kHz 5 kHz 7 kHz 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14). 11. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode. \* Read voltage on VTVM and calculate bias current by following formula: Bias current (A) = Value read on VTVM (V) $10(\Omega)$ Standard value: around 340 µA (Normal position) around 440 µA (CrO<sub>2</sub> position) : measured at TP1 (L-CH) and TP2 (R-CH) around 710 µA (Metal position) G Overall gain 1. Test equipment connection is shown in fig. 15. Condition: 2. Place UNIT into normal tape mode, and load the test Record /otanyback \* Record/playback mode tape (QZZCRA) \* Normal tape mode 3. Place UNIT into record mode. 00001/ \* Input level controls ... MAX 4. Supply 1kHz signal (-24 dB) from AF oscillaror, through ATT to LINE IN. LINE IN Record mode \* Output level control · · · MAX \* Standard input level; Adjust ATT until monitor level at LINE OUT becomes $MIC - 72 \pm 3 dB$ ck head LINE OUT LINE IN ... -24±3dB 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. Equipment: 7. If measured value is not 0.7 V, adjust VR7 (L-CH), \* VTVM \* AF oscillator Playback mode VR8 (R-CH). Test tape \* ATT \* Oscilloscope 8. Repeat from step (2). \* Resistor (600 Ω) Fig. 15 Test tape (reference blank tape) · · · QZZCRA for Normal

#### **MEASUREMENT & ADJUSTMENT ITEM** 1. Make connections as shown (See fig. 15). Fluorescent meter 2. Connect a wire between TP301 and ground Condition terminal (See fig. 16). \* Record mode 3. In the recording pause mode, apply 1 kHz \* Input level controls · · · MAX $(-24 \, dB)$ to LINE IN. \* Output level control · · · MAX VR301 4. Adjust ATT so that output level at LINE OUT Equipment: Earth is 0.7 V \* VTVM \* AF oscillator -40 dB adjustment \* ATT IC301 5. Adjust ATT so that the level adjusted at step Fig. 16 4 is reuced by 40 dB. At this time, check that $-40 \, dB$ indicator is - 40dB lighted halfway (intermediate brightness between full brightness and light-out: See fig. 40 PEAK 12 - 8 6 4 - 0 74 4 6 8 12 18 Fig. 17 7. If the indicator is not lighted halfway as described in step 6, adjust VR302. 0dB adjustment 40 PEAK 12 - 8 6 4 - 0 4 4 6 8 12 18 8. Restore the condition of step 4 (set LINE Fig. 18 OUT output level to 0.7 V). 9. At this time, check that 0 dB indicator is lighted halfway (intermediate brightness between full brightness and light-out: See fig. 18). 10. If improper, adjust VR301. 11. Repeat adjustments and checks at steps 4, 5, 6, 7, 8, 9 and 10 two or three times. 12. Disconnect the wire between TP301 and ground terminal, which had been connected at step 2. ( TP5 (L-CH) ( TP6 (R-CH) Dolby NR circuit 1. Test equipment connection is shown in fig. 20. (IC3 (L-CH) Place UNIT into record mode, set the Dolby NR switch VTVM (IC4 (R-CH) Condition: to OUT position and supply to LINE IN to obtain LINE IN \* Record mode -34.5 dB at PIN ① [IC3 (L-CH), IC4 (R-CH)] \* Dolby NR switch ... IN/OUT (frequency 5 kHz). \* Input level controls · · · MAX AF oscillator 3. Confirm that the value at IN position is $8(\pm 2.5) dB$ Equipment: greater than the value at OUT position of Dolby NR \* VTVM \* AF oscillator switch. \* ATT \* Oscilloscope \* Resistor (600 Ω) Oscilloscope Fig. 19 Input scanning time 1. Connect oscilloscope to 17 terminal of IC501. adjustment 2. Measure the time of input scanning signal with oscilloscope as shown in fig. 20. Condition: Standard value: About 10 msec \* Stop mode Equipment: 3. If the measured value is markedly different from the signal shown below, make the necessary adjustment with VR501. \* Oscilloscope IC501 VR501 - 10 msec Fig. 20



# MN1405RH (IC501) EACH TERMINAL FUNCTION AND WAVEFORM

### (BOTTOM VIEW)



Terminal No.	Symbol	Name	Function/operation
1.	vss	GND	
2.	CŌ11	TIMER REC-PLAY Signal output	Approx 200μs  Becomes "H" level only when power is supplied.
3.	CŌ10	FL meter reset	This output is for resetting the Peak Hold of the FL Meter. The pulse 2.5msec. width is transmitted in approx. 2-second cycles, regardless of the mechanism operation.
4.	CŌ9	TIME OUT	Not used.  Time indication  Becomes "H" level only during time indication
5.	CŌ8	No connection	Not used.

Terminal No.	Symbol	Name	Function/operation
6.	C <del>O</del> 7	Muting	"L" level 0.4 to 0.5 second after "PLAY" finish. "H" level in PAUSE, FF, REW STOP. "L" level approx. 0.4 second after "REC PAUSE" is switched to REC. "L" level approx. 0.4 second after command in case PAUSE mode is set to REC command.
7.	CŌ6	REC indication	"H" level simultaneously with REC indication. "H" level immediately after power is ON in TIMER REC mode. "H" level held if in TIMER REC position, when STOP AUTO RESET mechanism operates.
8.	CŌ5	PLAY indication	"H" level simultaneously with PLAY indication. Same as the above for TIMER PLAY.
9.	CŌ4	PAUSE indication	Pause indication  ————4.0V  "H" level simultaneously with PAUSE indication.
10.	СОЗ	FL grid & input SW. scan	ON-cycle 10 msec
11.	CŌ2	FL grid & input SW. scan	t <sub>1</sub> CO
12.	CO1	FL grid & input SW. scan	t, CO2 t,
13.	c <u>o</u> ∳	FL grid & input SW. scan	t, CO3 t,

Terminal No.	Symbol	Name	Function/operation
14.	A13	Input switch state reading	Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the cassette half detection leaf switch (S605) is ON, this terminal is connected to the HALL IC, MUSIC SELECT switch (S512) and SET switch (S511)).
15.	A12	Input switch state reading	Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the mode leaf switch (S602) is ON, this terminal is connected to the accidental erasing protection leaf switch (S601), memory repeat switch (S509), TAPE/TIME switch (S510) and TIMER PLAY switch (S513)).
16.	A11	Input switch state reading	Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the play leaf switch (S604) is ON, this terminal is connected to the REC MUTE switch (S508)).
17.	Α1φ	Input switch state reading	Reads switch states corresponding to scanning of CO $\phi$ — 3 (when the stop leaf switch (S603) is ON, this terminal is connected to the counter reset switch (S501).
18.	Bi3	REW key	Operation example  Counter reset switch (S501) and stop switch (S603) are connected to A10. If only S603 is closed, the waveform is as follows:  Approx.  2.4 m sec  Cassette half detection switch (S605), HALL IC output, MUSIC SELECT switch (S512) and SET switch (S511) are connected to A13. If all switches are OFF, the following waveform is obtained in FF or REW mode.  Reel table rotation pulses  Push the switch.
19.	Bi2	FF key	"H" in the normal case,  5.0V "L" when the switch is pushed.
20.	Bi1	PLAY key	<u> </u>
21.	Bi∳	STOP key	
22.	ЕОф	Brake plunger	FF indication Stop indication  3.0  "H" during FF/REW operations.
23.	EO1	Trigger plunger	Approx 70ms.  "H" until MODE SW is closed after the input to switch the
			mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.)

erminal No.	Symbol	Name	Function/operation
24.	EŌ2	Motor CL	Indication 2.0 V
			Approx 250msec  "H" until MODE SW is changed from "close" to "open" follow-
			ing the indication that the mechanism mode has been changed.  REW indication
			"H" in REW operation.
25.	EŌ3	Motor UNCL	Same as the above in MODE conversion. "H" during FF (Cue).
26.	TST	Chip test	Connected to GND.
27.	RST	RESET	Computer's RESET terminal. Reset is less than 0.8V.
			5.4 V
28.	CSLCT	CSLCT	Connected to GND.
29.	SNSφ	Input switch state reading	Reads switch states corresponding to scanning of CO $\phi$ — 3. (This terminal is connected to REC switch (S503), PAUSE switch (S502), switch detecting pulses between signal portions and TIMER REC switch (S513).
30.	SNS1	Reference signal reading	Time caount reference signal: approx. 1446 Hz
31.	DÕ∳	FL counter Segment a	Number indication Segment g (37) Segment a (31)
32.	DŌ1	FL counter Segment b	Segment f (36)——Segment b (32)
33.	DŌ2	FL counter Segment c	Segment e (35)——Segment c (33)
34.	D <del>O</del> 3	FL counter Segment d	Segment d (34) 5V ON
35.	D <del>O</del> 4	FL counter Segment e	Running indication  Segment g  I  OFF
36.	D <del>O</del> 5	FL counter Segment f	Segment c
37.	DŌ6	FL counter Segment g	Segment d  Counter number changes when takeup reel table rotates two turns. Each segment of running indication changes when the reel table rotates a half turn.  Waveforms change since dynamic lighting is used.



Terminal No.	Symbol	Name	Function/operation
38.	DO7	No connection	Not used.
39.	VDD	Power source	Operated at 4.5V to 6.0V.
40.	osc	Oscillation terminal	Oscillation is approx. 370 kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. Use $CO\phi$ to 3 in measuring the computer's velocity; Approx. 100 Hz in STOP condition.

# TROUBLESHOOTING OF MAIN CONTROL CIRCUIT

Fault	Probable cause	Microcomputer terminal to check	Relevant mechanism parts	Relevant external parts
Mechanism dose not operate at all.				
FL not lighting	Microcomputer not operating		-	
	Power not supplied.	39 (VDD)		
	Clock not oscillating.	40 (OSC 10 to 13		C503, C504 VR501 to R514
	Reset locked.	27 (RST)		C511, C506, Q506, Q401, R513, R512
	Microcomputer normal. (Scan normal)			
	Connection to FL Driver.	10 to 13 31 to 37		
FL lighting OK. (MODE LED not lighting.)	Half SW. closed.	14 (Ai3)	Half SW.	D502
MODE indicator lighting OK.	Motor circuit faulty.	24, 25	Motor connection	IC502

Fault	Probable cause	Microcomputer terminal to check	Relevant mechanism parts	Relevant external parts
Mechanism defective.				
FF/REW reverse rotation.	Reverse connection of motor.	24, 25	Motor connection	IC502
FF/REW motor rotating, reel not rotating.	Brake plunger not being with drawn.	22 (EO¢)	Brake plunger disconnection, etc.	IC502
CAM continuous rotation in PLAY.	MODE SW. defective.	15 (Ai2)	MODE SW.	D505, D501
Motor rotating in PLAY, but CAM's not switched.	Trigger plunger not operating	23 (EO1)	Trigger plunger	IC502
Motor rotates in reveise and does not stop after switching to PLAY or PAUSE.	PLAY or STOP SW, defective.	16 (Ai1) 17 (Ai¢)	STOP PLAY Leaf SW.	D504, Q502 D503, D511
REC IND. due not light up. (Operation is normal)	LED or drive transistor defective.	7 (CO6)		IC502
PLAY IND. dues not light up.	- do -	8 (CO5)		IC502
PAUSE IND. dues not light up.	· do -	9 (CO4)		IC502
Not counting.	Hall IC faulty, buffer circuit faulty.	14 (Ai3)	Reel magnet	IC503 (Hall IC) Q501, D502
AUTO STOP functioning soon after operation begins.	Same as the above. (Not counting)			
No muting.	Muting output connection etc.	6 (CO7)		
No peak-resetting.	Connection	3 (CO10)		Q301
Accidental erase prevention mechanism not functioning.	Leaf SW	15 (Ai2)	Accidental erasure Leaf SW	D501, 505
Operating during EJECT.	Half detection SW.	14 (Ai3)	Half detection SW.	D502

## OUTLINE OF dbx SYSTEM

In 1971, the dbx company of Massachusetts, U.S.A., succeeded in developing a logarithmic compression/expansion system for audio signals which extends across an extremely wide amplitude range and results in a very low distortion rate.

In this system, the dynamic range of the input signal is compressed to 1/2 its original level (measured in decibels), and then recorded. The recorded signal is then expanded (2x) prior to playback, in order to restore it to the original level. By this process, a dynamic range exceeding 100dB can be easily obtained by using an ordinary tape recorder.

This system is referred to as a decilinear noise reduction system, but is generally called the "dbx system", the name being derived from the dbx company.

#### The features of the dbx system

1. A significant noise reduction (approximately 30dB or more) is obtained over the entire audible frequency range.

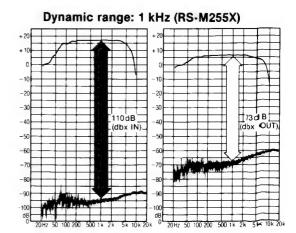
Noise reduction mode	S/N ratio RS-M255X	Remarks
Noise reduction "OUT"	58dB	CrO₂ tape, peak level
Dolby NR "IN"	66dB	CrO₂ tape, peak level
dbx "IN"	92dB	CrO₂ tape, peak level

- 2. A great improvement in the dynamic range makes it possible to extend the range to 110dB (at 1kHz, CrO, tape).
- 3. The direct logarthmic method of compression and expansion protects against problems caused by level mismatching.
- 4. Even if phase distortion occurs in the signal transmission system, precise operation is maintained by means of the RMS level detector.
- 5. A low distortion rate is maintained throughout the frequency range.
  - Improvement of high frequency response. The dbx system solves the problem of deteriorated high frequency at higher input levels which is an inherent fault of cassette tape equipment. The response at approx. 8,000 Hz at 10 dB input is improved as much as 14 dB. As a result, flatter response is obtained at both low and high input levels.



#### About dynamic range:

The dynamic range refers to the output range of an audio transmission system, extending from the lowest recognizable level to the highest possible level produced. Dynamic range is one of the values used to express the degree of fidelity of an audio transmission system.



# • Compressing the dynamic range to 1/2 before recording, and then expanding it (by 2x) before playback produces the remarkable dynamic range of the dbx system.

• The dynamic range of cassette tape with a saturation level of +10dB and a noise level of -45dB (such as Technics CrO<sub>2</sub> position tape) is 55dB. Any sounds with a level greater than +10dB will result in considerable distortion, and any sounds less than -45dB will be inaudible due to the effect of noise, making high-fidelity reproduction impossible.

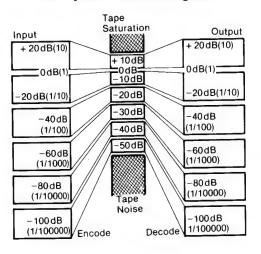
The dbx system, however, linearly compresses the input level by a ratio of 1/2 in decibels prior to recording it onto the tape. A + 20dB sound is thus compressed to + 10dB, a -20dB sound is compressed to -10dB, and a -90dB sound is compressed to -45dB.

As a result, a signal with a dynamic range extending from -90dB to +20dB (a 110dB dynamic range) can be contained within a range which extends from -45dB to +10dB (a 55dB dynamic range). Recording onto a cassette tape with a 55dB dynamic range is then possible.

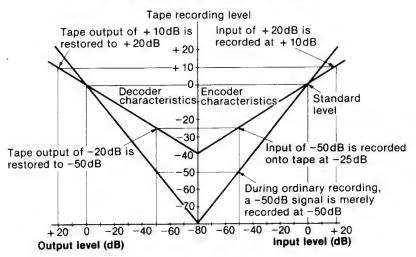
Prior to playback, the exact opposite process occurs and the sound levels are expanded. The +10dB sound is restored to its original level of +20dB, the -10dB sound is restored to -20dB, and the -45dB sound is restored to -90dB.

Therefore, the basic principle of the dbx system, as described above, is to compress the 110dB dynamic range by 1/2 to 55dB prior to recording, and then the expand it (by 2x) prior to playback.

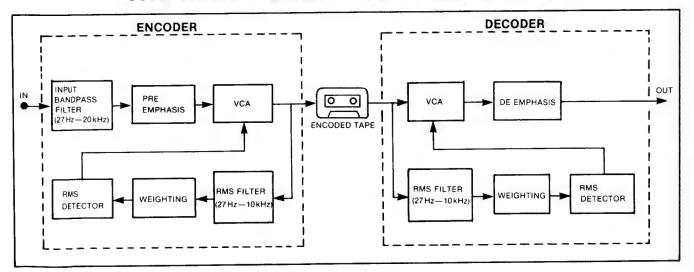
#### dbx system function diagram



#### Level compression/expansion diagram



## THE BLOCK DIAGRAM OF dbx SYSTEM



(Block configuration change for dbx circuit Encode/Decode is electrically performed by switching transistors between blocks.) -23

## **ENCODER**

• The portion of the dbx system with compresses the volume level of the input signal by 1/2 (measured in decibels), before seding it to the recording system, is called the encoder.

#### 1) INPUT BANDPASS FILTER (27 Hz-20 kHz)

To prevent pulse noise or other types of interference from causing erroneous operation of the dbx system, all signals outside the 27Hz—20kHz audio band range are eliminated here.

#### (2) PRE-EMPHASIS

The high frequency range, where hiss noise is prominent, is emphasized here during recording. The end result is that, although the dbx system is effective in reducing noise across entire frequency band, noise in the high frequency range is reduced still more by this pre-emphasis circuitry.

#### 3 VCA (voltage-controlled amplifier/attenuator)

This is an extremely important circuitry in the construction of the dbx system. In response to the incoming DC control voltage, the VCA varies the degree of amplification logarithmically in the same manner as the direct current, resulting in compression and expansion of the input signal's dynamic range.

#### (4) RMS DETECTOR (RMS: root mean square)

This is an important element in the composition of the dbx system, because its circuitry generates a DC voltage (the voltage that controls the degree of amplification in the VCA) in proportion to the size of the input signal.

It does this by detecting the root mean square value of the input signal, and then converting it to a DC voltage in proportion to the logarithm of the detected level.

Erroneous operation due to phase shift is prevented by monitoring of the voltage level derived from the root mean square value.

#### (5) WEIGHTING

To prevent the saturation level of the tape deck in high frequencies, this increases the RMS DETECTOR high frequency sensitivity and decreases the VCA high frequency gain. As a result, the linearity of the tape deck is enhanced in the high frequency range.

#### 6 RMS FILTER (27 Hz to 10 kHz)

This filter cuts any signal other than 27 Hz to 10 Hz that mixes in input signals to prevent the RMS DETECTOR from malfunctioning. Those to be cut include an FM tuner STEREO PILOT signal, tapedeck bias leakage and record player motor rotational noise. In addition, the signal in the frequency range (27 Hz to 10 kHz) passing through the BAND PASS FILTER is comparatively small in level variations when handled by the tape deck.

This ensures correct complementarity in the operation of the RMS DETECTOR and VCA during Encoding and Decoding.

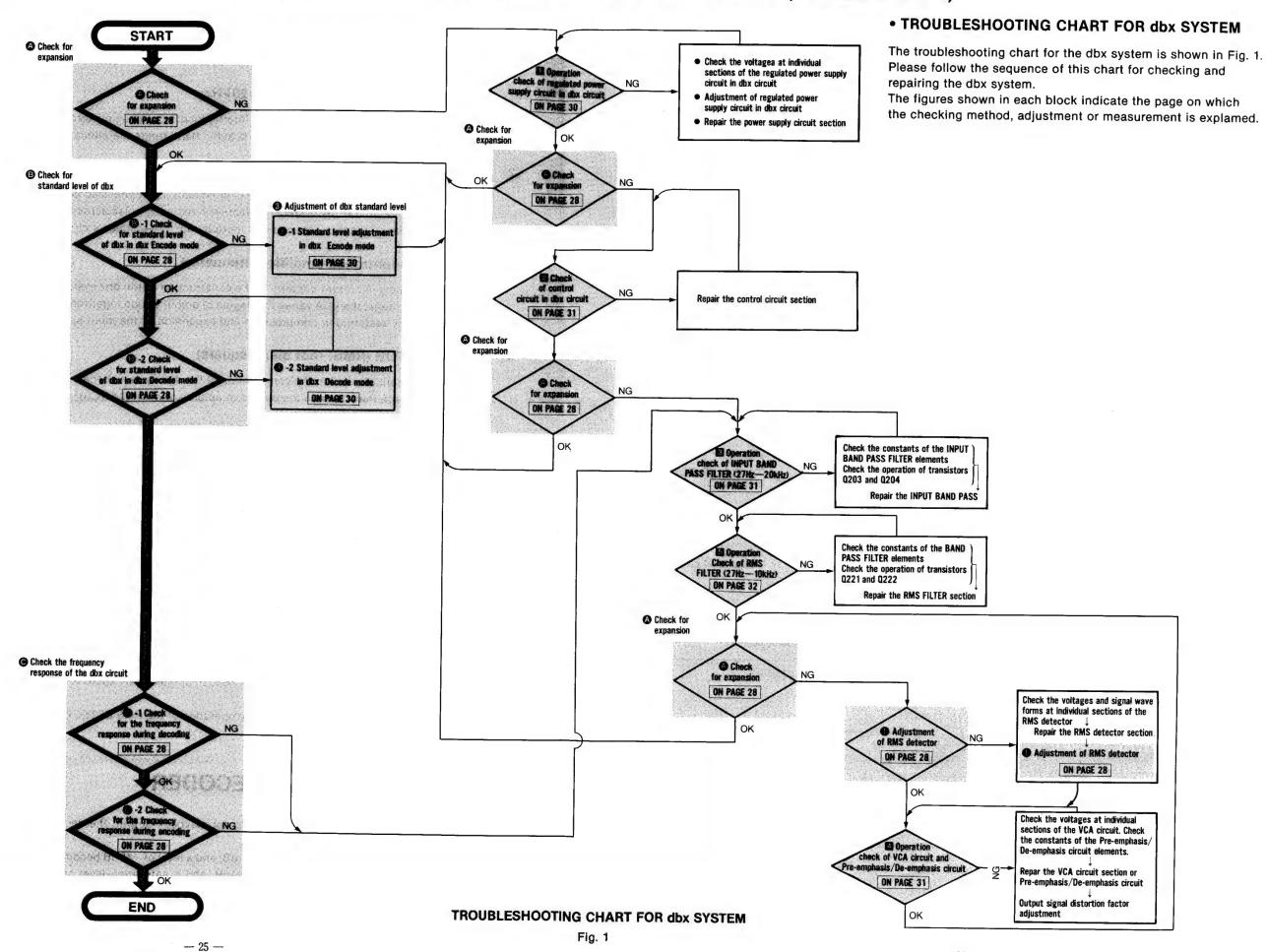
## **DECODER**

As shown in the diagram on the previous page, for playback output, the decoder expands the to instantly changing level to double the decibel range.

For example, 2-30dB signal is expanded to -60dB, and a level of -45dB becomes -90dB. On the Oh er hand, a playback output +10dB is expanded to +20dB, and a saturation level signal is also correspondingly increased.

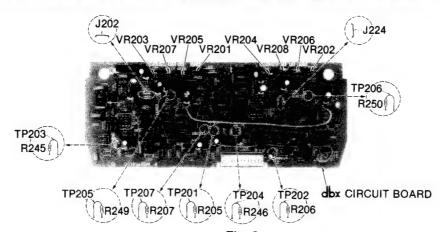
In terms of the system's operation, the decoder's function is the exact opposite of the function of the previously mentioned encoder.

# MEASUREMENT AND ADJUSTMENT METHODS (FOR dbx SYSTEM)

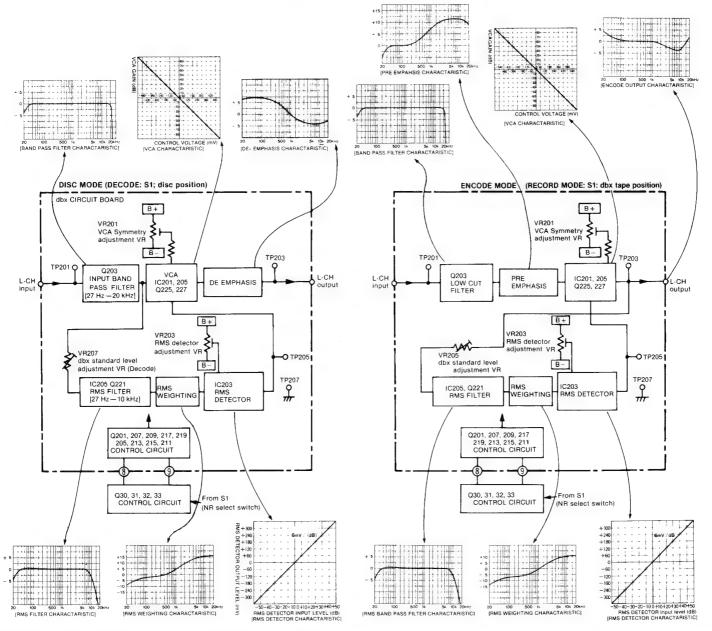


<del>- 26 -</del>

## • ADJUSTMENT PARTS LOCATION OF dbx SYSTEM



BLOCK DIAGRAM OF dbx SECTION (L-CH ONLY)



Note: Encode/decode selection of the dbx circuit in RS-M255X is done with a control circuit, composed of transistors. (This control circuit is interlocked with S1 (NR selection switch).)

Fig. 3

— 27 —

## dbx SYSTEM CHECKING METHOD

NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified

Input level controls: Maximum

Output level control: Maximum

#### ITEM CHECKING METHOD A Check for expansion A Check for expansion Condition: 1. Make the connections as shown in fig. 4 and LINE OUT LINE IN apply $1\,\mathrm{kHz}\,-27\,\mathrm{dB}$ signal from LINE IN, \* Stop mode @@@@^ \* Input level controls ... MAX and set the noise reduction selector to disc AT T \* Output level control · · · MAX AF oscillator Stop/record mode position $600\Omega$ \* Noise reduction selector 2. Adjust ATT, increase input signal level by 10 dB, Resistor ··· disc/dbx tape and make sure that the reading for VTVM Fig. 4 increases by 20 dB ± 1 dB. Equipment 3. Adjust ATT, decrease the input signal level, and make sure that the reading for VTVM decreases by \* VTVM \* AF oscillator $20 dB \pm 1 dB$ \* ATT \* Oscilloscope \* Resistor (600 Ω) Check for standard **B**-1 Check for standard level of dbx in dbx Encode mode level of dbx 1. Make the connections as shown in fig. 5 and VTVM Oscilloscope Condition: apply $1 \, \text{kHz} - 27 \, \text{dB}$ signal from LINE IN, TP203 (L-CH) TP201 (L-CH) \* Stop/record mode and set the noise reduction selector to dbx TP202 (R-CH) \* Input level controls ... MAX tape position. VTVM Oscilloscope 2. Set the unit to record mode, adjust ATT so \* Noise reduction selector TP207 ··· disc/dbx tape Record mode that the signal level at TP201 (L-CH) and 0000 TP202 (R-CH) is 300 mV. Equipment $600\,\Omega$ LINE IN 3. Make sure that the signal level at TP203 (L-CH) \* VTVM \* AF oscillator and TP204 (R-CH) is 300 mV ± 0.5 dB Resistor \* Oscilloscope \* ATT \* Resistor (600Ω) Fig. 5 B-2 Check for standard level of dbx in dbx Decode mode 1. Make the connections as shown in fig. 5 and apply $1\,\mathrm{kHz}-27\,\mathrm{dB}$ signal from LINE IN, and check as follows Set the noise reduction selector to disc position and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV 3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is $300\,\mathrm{mV}\pm0.5\,\mathrm{dB}$ . Check the frequency **©**-1 Check the frequency response during decoding response of the dbx 1. Make the connections as shown in fig. 5 and apply 1 kHz Specifications-1 circuit -27 dB signal from LINE IN. and check as follows: Condition 2. Set the noise reduction selector to disc position, and adjust

- \* Stop/record mode
- \* Input level controls ... MAX
- \* Noise reduction selector ··· disc/dbx tape

#### Equipment:

- \* VTVM
- \* AF oscillator
- \* ATT
- \* Oscilloscope
- \* Resistor (600Ω)
- ATT so that te signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV
- 3. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0 dB, change the signal frequency to 100 Hz, 20 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-1

#### **G**-2 Check the frequency response during encoding

- 1. Make the connections as shown in fig. 5 and apply 1 kHz -27 dB signal from LINE IN, and check as follows:
- Set the noise reduction selector to dbx tape position, and the unit to record mode.
- 3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV
- 4. With the signal level at TP203 (L-CH) and TP204 (R-CH) as OdB, change the signal frequency to 100 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-2.

Frequency	Signal levels at TP203 and TP204
1 kHz	0 dB (300 mV)
100 Hz	$-0.5\mathrm{dB}\pm1\mathrm{dB}$
20 Hz	$-30\mathrm{dB}\pm5\mathrm{dB}$
7 kHz	+7dB±1dB

#### Specifications-2

Frequency	Signal levels at TP203 and TP204
1 kHz	0 dB (300 mV)
100 Hz	+0.5dB±1dB
7 kHz	$-3.5\mathrm{dB}\!\pm\!1\mathrm{dB}$

#### NOTES:

- If the results of the above checks (A). (B) and (O) do not satisfy the specifications, perform the following adjustments.
- If the specifications are not satisfied even after the adjustments, follow the checking procedure for problems.
- If the output signal is not produced or is extremely distorted, follow the checking procedure for problems.

## ADJUSTMENT OF dbx SYSTEM

NOTES: When adjusting the circuit of the dbx system, be sure to perform the adjustments in the following order:

Keep good condition, set switches and controls in the following positions, unless otherwise specified.

• Input level controls: Maximum

#### **ADJUSTMENT ITEM** VTVM Oscilloscope 1. Make the connections as shown in fig. 6. and Adjustment of RMS TP201 (L-CH) dbx circuit board N set the noise reduction selector to disc position. detector TP202 (R-CH) TP207 (Earth) Apply 100 Hz - 27 dB signal from LINE IN. Condition VR203 (L-CH) VR204 (R-CH) Adjust ATT so that the signal level at TP201 TP206 (L-CH) \* Stop mode (L-CH) and TP202 (R-CH) becomes 300 mV TP207 (R-CH) · ] [0000] ] \* Input level controls ... MAX Make sure that the output signal at TP205 AT T \* Noise reduction selector 600Ω 1 AF oscillator disc position (L-CH) and TP206 (R-CH) is at 200 Hz sine · · · disc Equipment: If the output signal is not sinusoidal as shown Fig. 6 \* VTVM \* AF oscillator in fig. 7, adjust VR203 (L-CH) and VR204 \* Oscilloscope \* ATT (R-CH) to make it sinusoidal. \* Resistor (600 Ω) NOTE: The voltage of the output signal after adjustment Wave form after adjustment Wave form before adjustment is about 0.5 mV rms. (sine wave) Fig. 7 Preparation before adjustment Adjustment of VCA 100Ω Condition: 1. Before adjusting VCA, from the device shown below using resistors of $100\Omega$ and $3.9\Omega$ (See fig. 8). \* Record/stop mode 3.9Ω Set NR switch to dbx disc. \* Input level controls · · · MAX Remove jumpers [J202 (L-CH) and J224 (R-CH)]. \* Noise reduction selector Arrange connections referring to wire connection diagram (fig. 9 and 10). ··· disc/dbx tape Fig. 8 since $0\,\mathrm{V.} + 180\,\mathrm{mV}$ and $-180\,\mathrm{mV}$ (DC) are applied in this order to pin Equipment: 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH) \* VTVM \* Oscilloscope \* Resistor (100 $\Omega$ , 3.9 $\Omega$ ) IC201 (L-CH) ( IC202 (R-CH) ( IC201 (L-CH) dbx circuit board dbx circuit board IC202 (R-CH) 100Ω 3.9Ω 100 Ω 3.9 Ω DC power supply TP207 DC power supply 7 TP20 TP203 (L-CH) TP203 (L-CH)) TP204 (R-CH) disc position disc position Oscilloscop Connections when applying -180 mV Connections when applying +180 mV Adjust DC power supply and arrange connections and 0V so that - 180 mV can be applied to TP203 Adjust DC power supply and arrange connections (L-CH) and TP204 (R-CH). so that + 180 mV or 0 V can be applied to TP203 (L-CH) and TP204 (R-CH). Fig. 10 Fig. 9 Adjustment procedure 1. Apply 0 V to pin 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH), and a horizontal line will appear on the screen of the oscilloscope. Use this line as the reference line. 2. Apply ±180 mV to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH) (See fig. 9), and check that the level is not more than 10 mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). 3. In the same way, apply $-180\,\mathrm{mV}$ to pin (2) of IC201 (L-CH) and pin (2) of IC203 (R-CH) (See fig. 10), and check that the level is not more than 10 mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). +10 mV When 0 V is applied to pin 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH), this horizontal line appears. \_10 mV ± 4. Repeat steps 2 and 3, and adjust VRs so that the levels are within $\pm 10\,\mathrm{mV}$ when $+ 180\,\mathrm{mV}$ Oscilloscope screen and - 180 mV are applied (fig. 11). 5. After adjustment, connect jumpers J202 (L-CH) Fig. 11 and J224 (R-CH) (See fig. 2). Adjustment of dbx NOTE: Be sure to perform the standard level adjustment in dbx Encode, followed by the standard level adjuststandard level ment in dbx Decode. Condition \* Record/stop mode \* Input level controls ··· MAX

ITEM	ADJUSTMENT
* Noise reduction selector	<ul> <li>3-1 Standard level adjustment in dbx Encode mode</li> <li>1. Make the connection as shown in fig. 12 and apply 1 kHz — 27 dB signal from LINE IN, and set the noise reduction selector to dbx tape position.</li> <li>2. Set unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.</li> <li>3. Adjust VR205 (L-CH) and VR206 (R-CH) so that the output signal level at TP203 (L-CH) and TP203 (L-CH) and TP204 (R-CH) becomes 300 mV ± 0.5 dB.</li> <li>3-2 Standard level adjustment in dbx Decode mode</li> <li>1. Make the connection as shown in fig. 12 and apply 1 kHz — 27 dB signal from LINE IN, and perform the following adjustments.</li> <li>2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV.</li> <li>3. Adjust VR207 (L-CH) and VR208 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300 mV.</li> <li>3. Adjust VR207 (L-CH) and VR208 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300 mV ± 0.5 dB.</li> </ul>
NOTES  • After a • If the	: adjustments ①. ② and ③, re-check according to "dbx SYSTEM CHECKING METHOD". specifications are not satisfied, perform the adjustments again.

## CHECKING PROCEDURE FOR PROBLEMS

**NOTES:** Find defective parts according to the circuit operation checking method given below, and use the results for your reference during repair. Remember to adjust after repair.

Keep good condition, set switches and controls in the following positions, unless otherwise specified.

• Input level controls: Maximum

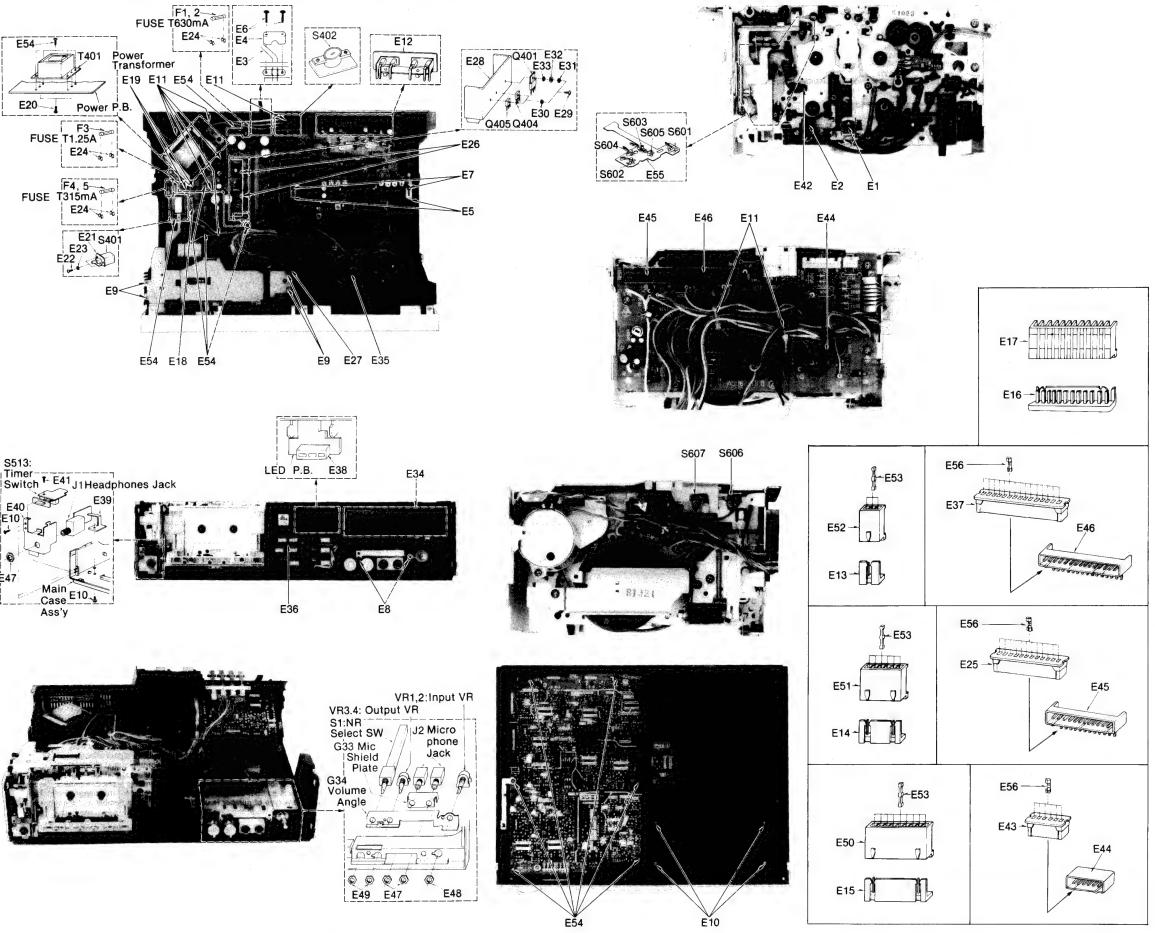
ITEM	CHECKING METHOD
Operation check of regulated power supply circuit in dbx circuit  Equipment: DC volt meter Oscilloscope	Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q401 is around +10.5 V.  The connection as shown in fig. 13 and make sure that the emitter voltage of Q401 is around -10.5 V.  The connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around -10.5 V.  The connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around -10.5 V.  The connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around -10.5 V.  The connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around -10.5 V.

#### ITEM CHECKING METHOD 2 Check of control E.C.B (G.S.D) voltage check of each switching transistor for Encode/Decode circuit in dbx circuit The terminal voltage of each switching transistor in Encode/Decode mode are shown in the table below. Equipment: Encode (dbx tape) Decode (dbx tape) \* DC volt meter C (S) C (S) B (D) Ref. No. E (G) C (S) B (D) E (G) B (D) E (G) -0.001V 0.581 0.018V 0.015V 0.62V 1.168V 0.017V ٥V Q30 0٧ -0.001V -0.001V 0.006V -0.001V 0.006V 0.65V 0٧ 10.66V 0.65V 031 10.75V 10.74V 10.1V 10.78V 10.62 V 10.72V 10.77V 10.1V 10.78V Q32 -10.72V 5.97V -10.67V -10.72V -10.70V -10.04V -10.73V -10.70V -10.04V Q33 0.074V -0.029V 0٧ 1.69V 1.64 V 0.99V 0.055V -0.035V0٧ Q3 0.65V 0.04V 0.04V 0.65V 0.04V 0.04V Q11, 12 -10.8V 0 V 0٧ 0.04V -10.8V 0.04V 0٧ Q13. 14 0.58V ΩV 0٧ -10.8V ٥v Q201, 202 -10.8V ٥٧ -10.8V 0 V 0٧ +0.43V 0٧ ٥v ٥v -0.77V 0 V -1.45V-10.62V -1.42V -1.42V -0.77V -1.42V-1.42V Q205, 206 -1.45V -0.83V -1.42V -10.7V 0٧ -1.42V-10.71V Q207, 208 -145VOV 0٧ -10.7V ٥v 0.61V -0.15V 0.0 -10.7V ٥v Q209, 210 ٥v 0٧ 0.64V ٥v ٥v 0.63V ٥v -0.11V -10.61V ٥V Q211, 212 -0.29V 0.33V -0.1V -0.1V -10.56V -0.29V -10.56V٥V Q213, 214 ٥v -10.65V -0.29V 0.47V ٥V -0.1V--10.65V ٥v Q215, 216 -0.1V -0.1V0.64V ٥v 0.64V Q217, 218 0.0 0.01V-10.62V٥v OV 0.0 -10.71V ٥v -10.7 V-1.42V٥v Q219, 220 0.01V 0.0 0.62V -1.42VQ223, 224 -10.75V -10.54V -10.61V-10.72V 10.64 V -10.62V-10.77V -10.76V-10.12V NOTE: • If no abnormality is found in steps 11 and 2, check the operation for each part as follows: 1. Make the connections as shown in fig. 14, and Operation check of Q201 (L-CH) Q202 (R-CH) Oscilloscope apply $100 \, \text{Hz} - 27 \, \text{dB}$ signal from LINE IN, and INPUT BAND PASS dbx circuit board TP203 (L-CH) TP204 (R-CH) FILTER circuit set the noise reduction selector to dbx tape (27 Hz - 20 kHz) position. 200002 Set the unit to record mode. Condition AF oscillator ATT 600Ω Adjust ATT so that the signal level at TP201 TP207 \* Record mode dbx circuit board (L-CH) and TP202 (R-CH) is 300 mV. LINE IN \* Input level controls ... MAX Make sure that the emitter signal level of Q203 \* Noise reduction selector (L-CH) and Q204 (R-CH) is 300 mV · · · dbx tape Oscilloscope VTVM 5. Set the input signal frequency to 5 kHz and Equipment: make sure that the emitter signal of Q203 Fig. 14 \* AF oscillator \* VTVM (L-CH) and Q204 (R-CH) remains at the same \* Oscilloscope \* ATT level (300 mV). \* Resistor (600 Ω) 4-1 Operation check of VCA circuit and Pre-emphasis circuit 4 Operation check of VCA circuit and 1. Make the connections as shown in fig. 15, and TP203 (L-CH) VTVM Oscilloscope Pre-emphasis/ TP204 (R-CH) apply $100 \,\mathrm{Hz} - 27 \,\mathrm{dB}$ signal from LINE IN. De-emphasis circuit TP201 (L-CH) Short pin (3) of IC201 (L-CH) and IC202 TP202 (R-CH) Condition: (R-CH) to TP207 (ground) as shown in fig. LINE IN \* Stop/record mode dbx circuit board Set the unit to record mode, and set the noise \* Input level controls ... MAX ATT AF oscillator $600\,\Omega$ reduction selector to dbx tape position. \* Noise reduction selector ··· disc/dbx tape Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV Equipment: Oscilloscope 5. Make sure that the output signals at TP203 \* AF oscillator \* VTVM Fig. 15 (L-CH) and TP204 (R-CH) are sinusoidal. \* ATT \* Oscilloscope (The operation of VCA can then be checked.) \* Resistor (600 Ω) IC201 (L-CH) 6. Shift the frequency of input signal to 5 kHz, and make sure that IC202 (R-CH) the output signal levels at TP203 (L-CH) and TP204 (R-CH) 1 are increased by about 12 dB. **Љ** UРС1252Н Ф (The operation of the Pre-emphasis circuit can then be checked.) **\_**@-@-@@<sup>l</sup> Connection wire TP207

Fig. 16

ITEM	CHECKING METHOD				
	<ol> <li>4-2 Operation check of VCA circuit and De-emphasis circuit</li> <li>The procedure is the same as 1 for the above 4-1 VCA circuit and Pre-emphasis circuit.</li> <li>Short pin ② of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 17.</li> <li>Set the noise reduction selector to disc position.</li> <li>Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.</li> <li>Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.)</li> <li>Change the frequency of input signal to 5 kHz and make sure that the output signal level at TP203 (L-CH) and TP204 (R-CH) is decreased by about 12 dB. (The operation of the De-emphasis circuit can then be checked.)</li> </ol>				
Operation check of RMS FILTER circuit (27 Hz - 10 kHz)  Condition: Stop mode Input level controls ··· MAX Noise reduction selector ··· disc  Equipment: VTVM * AF oscillator ATT * Oscilloscope Resistor (600 Ω)	<ol> <li>Make the connections as shown in fig. 18. and apply 100 Hz — 27 dB signal from LINE IN.</li> <li>Set the noise reduction selector to disc position.</li> <li>Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.</li> <li>Make sure that the emitter signal level of Q221 (L-CH) and Q222 (R-CH) is around 300 mV.</li> <li>Change the frequency of input signal to 5 kHz and make sure that the emitter signal of Q221 (L-CH) and Q222 (R-CH) remains at the same level (300 mV).</li> </ol> Fig. 18				

# **ELECTRICAL PARTS LOCATION**



#### REPLACEMENT PARTS LIST

Important safety notice
Components identified by A mark have special
characteristics important for safety.
When replacing any of these components, use
only manufacturer's specified parts.

Ref No.	Part No.	Part Name & Description
	ELECTRICA	AL PARTS
E 1 E 2 E 3 [D] ∆ [For all E	QWY4123Z QWY2138Z SJA88 uropean areas excep	Record/Playback Head Erase Head AC Power Cord of United Kingdom.]
[B] <u></u>	QFC1205	AC Power Cord
E 4	ed Kingdom.] QTD1164	Cord Bushing
E 5 E 6 E 7	QMA4402 XTN3 + 16B XTN3 + 10B	dbx P.B. Holder Tapping Screw Tapping Screw
E 8 E 9	XTN3 + 8B XTS3 + 12B	Tapping Screw Tapping Screw
E 10	XTB3 + 10BFN	Tapping Screw
E 11 E 12 E 13	QTD1181 QEJ5003S QJP1921TN	Wire Clamper Jack Board 3 Pin Post
E 14	QJP1922TN	6 Pin Post
E 15 E 16	QJP1923TN QJP1924TN	9 Pin Post 12 Pin Post
E 17	QJS1924TNL	12 Pin Socket
E 18	QCR0011 SJT777	Spark Killer Pin Terminal
E 20	XTN3 + 8B	Tapping Screw
E 21	QMA4364	Switch Angle
E 22 E 23	XSN3+8S XWA3B	Screw Washer
E 24 ▲	QTF1054	Fuse Holder
E 25 E 26	QJS12001T XTN3 + 10B	12 Pin Socket Tapping Screw
E 27	QJT0015	Lug Terminal
E 28 E 29	QTH1164 XSN3 + 8S	Heat Sink Screw
E 30	XWA3B	Washer
E 31	XWE3	Washer
E 32 E 33	N024B N018E	insulator Plate Insulator Plate
E 34	QSIFM004F	FL Meter
E 35 E 36	QJT1067 QKJ0520	Check Pin Led Holder-A
E 37	QJS15001T	15 Pin Socket
E 38 E 39	QKJ0521 QJC0050	LED Holder-B Earth Plate
E 40	QMA4365	Timer Angle
E 41	XTN3 + 6B	Tapping Screw
E 42 E 43	XAMQ44P300 QJS06001T	Pilot Lamp 6 Pin Socket
E 44	QJP06S001T	6 Pin Post
E 45 E 46	QJP12L001T QJP15L001T	12 Pin Post (L-type) 15P Post (L-type)
E 47	QNQ1070	Nut
E 48 E 49	QNQ1039 QNQ1004	Nut Nut
E 50	QJS1923TN ·	9 Pin Socket
E 51	QJS1922TN	6 Pin Socket
E 52 E 53	QJS1921TN QJT1054	3 Pin Socket Contact
E 54	XTN3 + 10BFN	Tapping Screw
E 55 E 56	QJi1466RR QJT1089	Leaf Switch Circuit Board Contact

•

have special

ponents, use

Part Name & Description

### PARTS

Record/Playback Head Erase Head AC Power Cord United Kingdom.] AC Power Cord

Tapping Screw
Tapping Screw
Tapping Screw
Tapping Screw
Tapping Screw
Tapping Screw
Wire Clamper
Jack Board
3 Pin Post
6 Pin Post
9 Pin Post
12 Pin Socket
Spark Killer
Pin Terminal
Tapping Screw

dbx P.B. Holder Tapping Screw

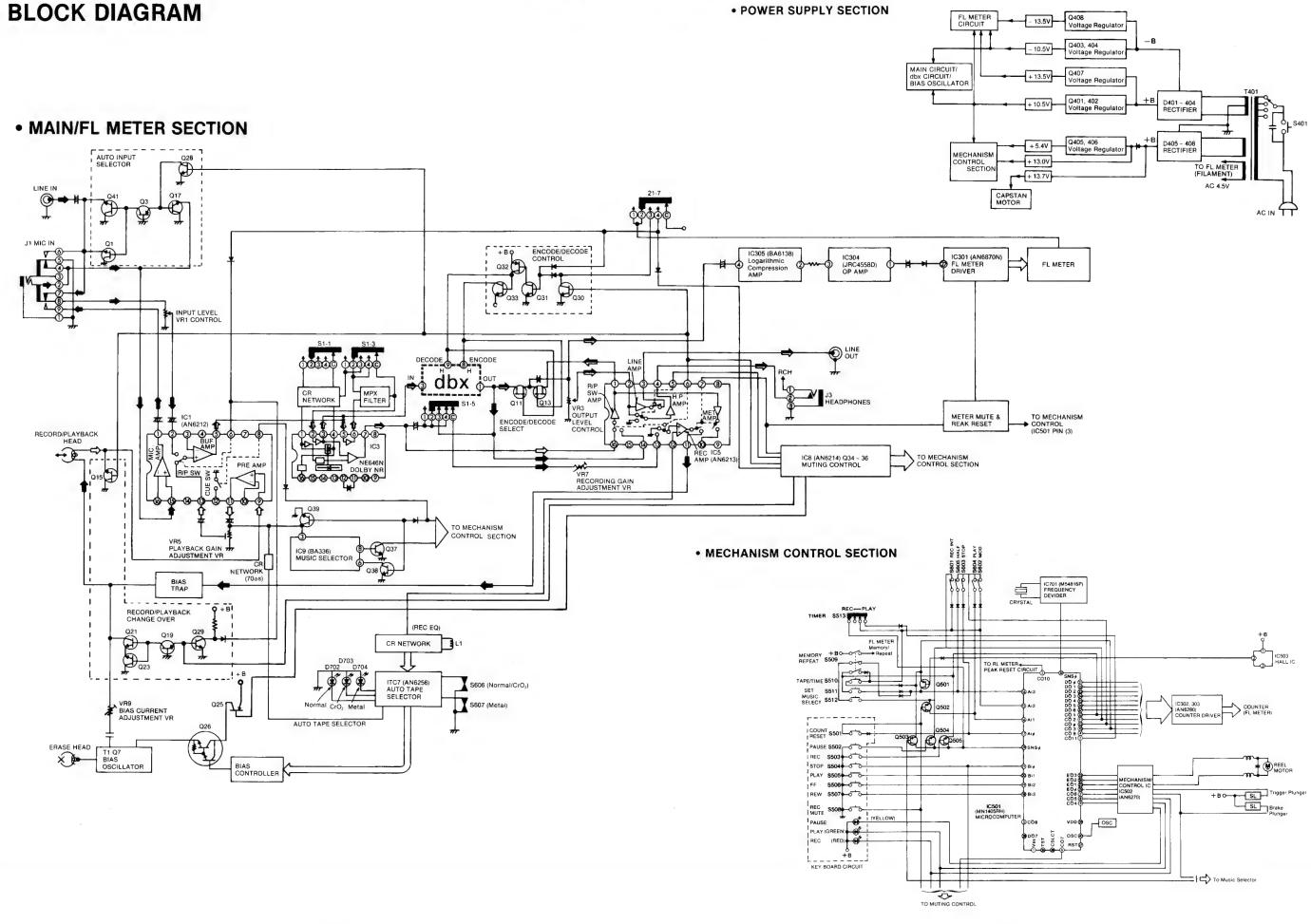
Switch Angle Screw Washer Fuse Holder 12 Pin Socket Tapping Screw Lug Terminal Heat Sink Screw Washer

Washer Insulator Plate Insulator Plate FL Meter Check Pin Led Holder-A 15 Pin Socket LED Holder-B Earth Plate Timer Angle

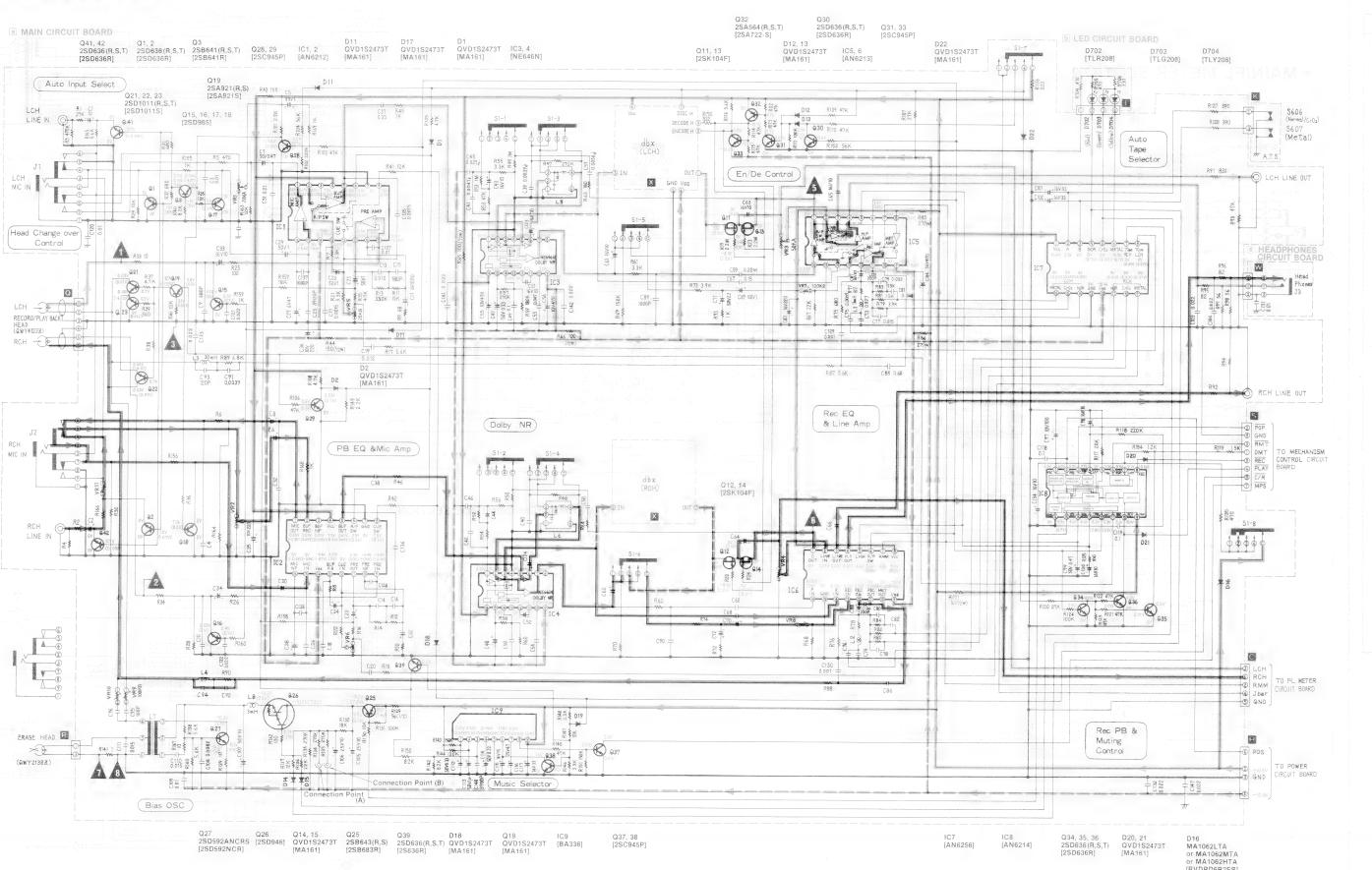
Tapping Screw Pilot Lamp 6 Pin Socket 6 Pin Post 12 Pin Post (L-type) 15P Post (L-type) Nut Nut Nut 9 Pin Socket

6 Pin Socket

3 Pin Socket
Contact
Tapping Screw
Leaf Switch Circuit Board
Contact







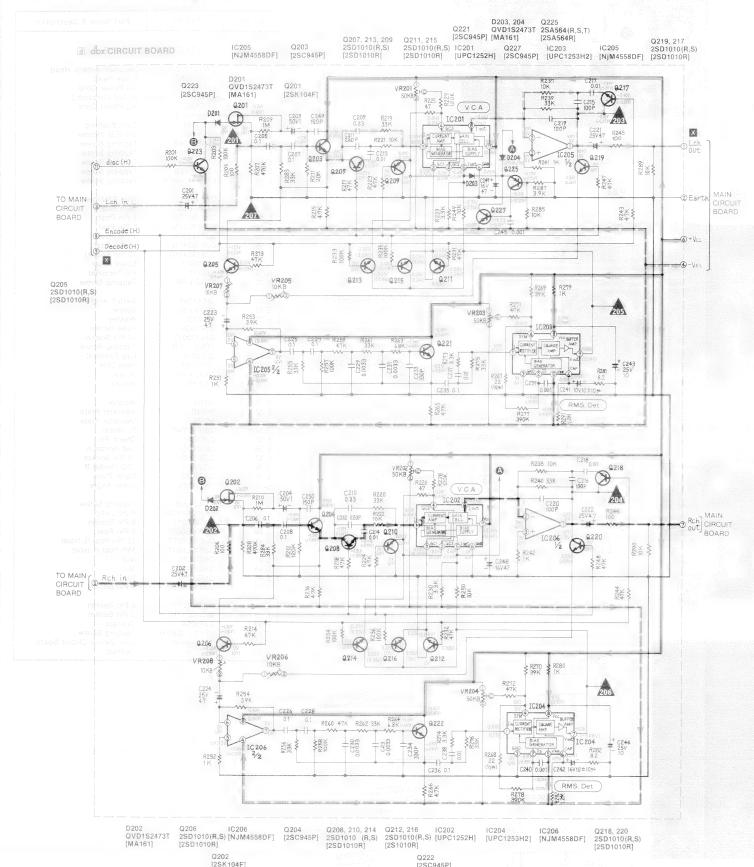
SCHEMATIC DIAGRAM

MAIN SECTION

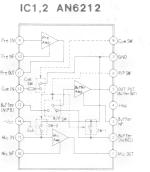
RCH LINE OUT

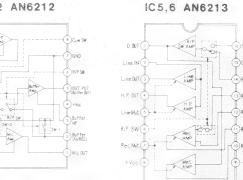
TO POWER
GND CIRCUIT BOARD

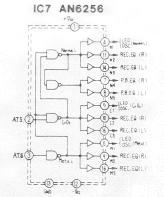
# dbx SECTION

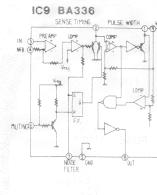


## **EQUIVALENT CIRCUITS**









Truth table of IC1, 2 (Postive)

R/P SW

pin	Operation
Н	REC
L	PB

SW-1, SW-2

6 pin	Operation		
Н			
L	Mute		

Cue SW

8)pin	Operation		
Н			
L	Cue		

Truth table of IC5, 6 (Positive)

#### R/P SW

6 pin	Operation
Н	REC-
L	PB

M	u	t	1	r	١	Ø
						0

), ⑦Pin	Operation
Н	Muting OFF
L.	Muting ON
	L : GND Leve

NOTES: NR select switch (shown in OUT position: (1) Dolby NR,

(2) OUT, (3) dbx tape, (4) dbx disc)

Auto tape select switch (For Normal/CrO<sub>2</sub> tape) · S606 • S607

Auto tape select switch (For Metal tape)

Mode	S606	S607
Normal	on	on
CrO <sub>2</sub>	on	off
Metal	off	off

- VR3, 4. Output level control.
- VR5, 6.VR7, 8. Playback gain adjustment VR.
- Recording gain adjustment VR. Blas current adjustment VR. • VR9, 10. VR201, 202
- VCA symmetry adjustment VR. RMS detector adjustment VR.
- VR205, 206. dbx standard level adjustment VR (Encode). dbx standard level adjustment VR (Decode).
- ullet Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise  $1K = 1,000 (\Omega), 1M = 1,000 k (\Omega)$
- $\circ$  Capacity are in microfarads ( $\mu F$ ) unless specified otherwise.
- The mark (♥) shows test point, e.g. v = test point 1.
  All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise
- Voltage values shown in MAIN SECTION.
   NO MARK.... Voltage values at out (NR select switch) mode
- Voltage values at record mode.
   Voltage values at disc (NR select switch) mode
   Voltage values at disc (NR select switch) mode
   Voltage values at out (NR select switch) mode.

  - . Voltage values at disc (NR select switch) mode. For measurement use VTVM.
- ( ) indicates B + (bias). ( ) indicates B (bias).

- ( ) indicates the flow of the playback signal (dbx out).

  ( ) indicates the flow of the playback signal (dbx tape).

  ( ) indicates the flow of the recording signal (dbx out).

  ( ) indicates the flow of the recording signal (dbx tape).

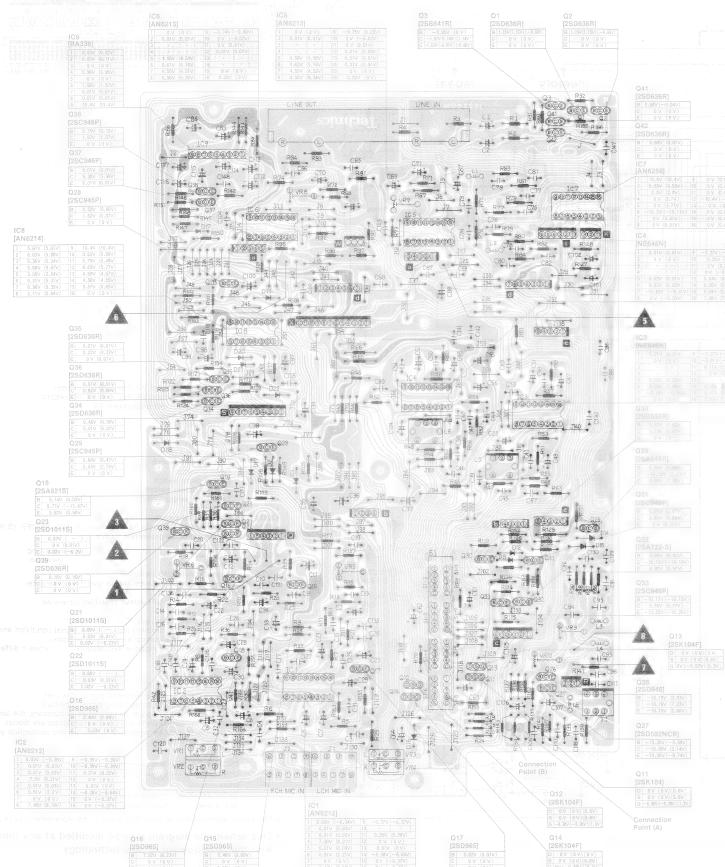
  Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
- e.g. Q1 2SC1844 (E, F) →Production parts number [2SC1844E] Supply parts number D212
  - 1S2473T77 Production parts number.
- | MA161| Supply parts number:
  | Ma161| Supply parts numbers
  | The supply parts number is described alone in the replacement parts list.
  | Ma161| Ma1
- This schematic diagram may be modified at any time with the development of new technology.

\* Input level controls ... MAX SPECIFICATIONS \* Output level control · · · MAX

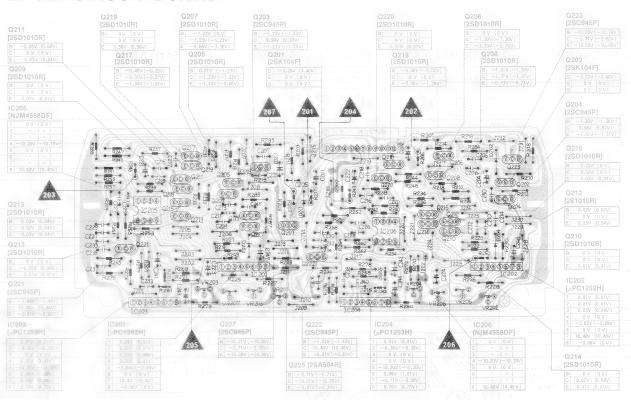
Playback S/N ratio  * Test tape QZZCFM	Greater than 45 dB
Overall distortion  * Test tape  QZZCRA for Normal  QZZCRX for CrO <sub>2</sub> QZZCRZ for Metal	Less than 4%
Overall S/N ratio  * Test tape ··· QZZCRA	Greater than 43 dB (without NAB filter)

# **CIRCUIT BOARDS**

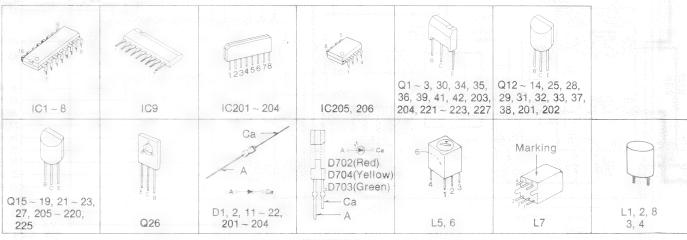
## a MAIN CIRCUIT BOARD



# d dbx CIRCUIT BOARD



## **TERMINATIONS**



- NOTES:

  The circuit shown in the conductor is B + (bias) circuit.

  The circuit shown in on the conductor is B (bias) circuit.

  Values indicated in are under no signal condition and playback mode with volume control at minimum position otherwise specified.

  Voltage values shown in MAIN CIRCUIT BOARD

  NO MARK... Voltage values at Out (NR select switch) mode

  ...... Voltage values at record mode

  ...... Voltage values at disc (NR select switch) mode

  Voltage values shown in dbx CIRCUIT BOARD

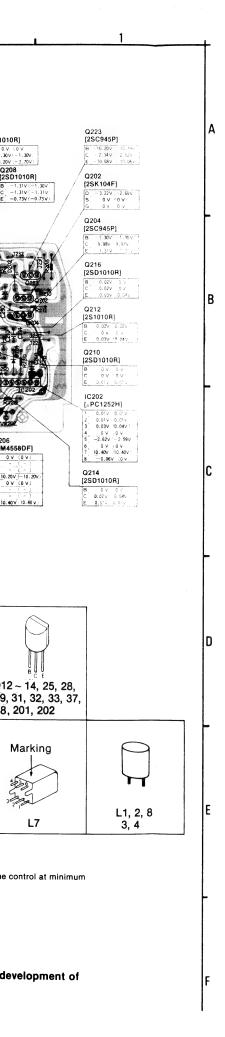
  NO MARK... Voltage values at disc (NR select switch) mode

  Voltage values shown in dbx CIRCUIT BOARD

  NO MARK... Voltage values at disc (NR select switch) mode

  ( ) ...... Voltage values at MX (RR select switch) mode.

- ( )......Voltage values at Out (NR select switch) mode. For measurement use VTVM.
- This circuit board diagram may be modified at any time with the development of new technology.



NOTES: RESISTORS CAPACITORS ERD...Carbon ECBA . . . . Ceramic ECE .... Electrolytic ERG. . . Metal-oxide ECG .... Ceramic ECE N... Non polar electrolytic ERS... Metal-oxide ECK . Ceramic ECQS.... Polystyrene ERO... Metal-film ECC . Ceramic ECS .... Tantalum ERX... Metal-film FCF . Ceramic QCS..... Tantalum ERQ... Fuse type metallic ECQM.... Polyester film ERC...Solid ECQE . . . Polyester film ECQF . . . . Polypropylene ERF...Cement

#### REPLACEMENT PARTS LIST

Ref No. Part No.	Ref No. Part	No. Ref No.	Part No.	Ref No.	Part No.	Bot No	Dort No.	T Dod No	Dord No.	Dof No.	Don't M.
Her No. Part No.			ERD25TJ394	VR 302	Part No. EVNM4AA00B53	Ref No.	Part No.	Ref No. C 505	Part No.	Ref No. 407, 408, 4	Part No.
RESISTORS	R 130 ERD25	R 279, 280	ERD2513394 ERD25FJ102	VR 501	EVNK4AA00B14	C 121, 122	ECKD1H223ZF	C 505	ECKD1H332ZF	407, 400, 2	SM112
D.1.0	R 131 ERD25		ERD25FJ8R2			C 123, 124	ECEA1HS100	C 506	ECEA50ZR2R2	D 410, 411	MA1056
R 1, 2 ERD25TJ273 R 3, 4 ERD25TJ474	R 132 ERD25		ERD25TJ333	CAI	PACITORS	C 125, 126	ECCD1H221K	C 507	ECKD1H222MD	D 412, 413	MA161
R 3, 4 ERD25TJ474 R 5, 6 ERD25FJ471	R 133, 134, 135	R 285	ERD25FJ103	C 1 2	ECEA1UC100	C 127, 128	ECKD1H103ZF	C 508	ECEA1CN100	D 414, 415 D 416	MA1150A
R 7, 8 ERD25FJ332	R 136 ERD25		ERD25FJ392 ERD25FJ103	C 1, 2 C 3, 4	ECEA1HS100 ECFDD103KXY	C 129, 130 C 132, 133	ECKD1H102KB ECKD1H223ZF	C 511 C 702	ECEA50ZR1 ECCD1H390KC		MA1033LLF 503, 504, 505, 50
R 9, 10 ERD25FJ680	R 137 ERD25		ERD25TJ125	C 5, 6	ECEA50Z1	C 135, 136	ECQM1H152JZ	C 702	ECCD1H101KC		509, 510, 511, 51.
R 11, 12 ERD25FJ103	R 138 ERD25			C 7, 8	ECEA50ZR47	C 141, 142,		C 704	ECCD1H470KC	513, 514	MA161
R 13, 14 ERD25TJ334	R 139 ERD25		ERD25FJ471	C 9, 10	ECKD1H681KB		ECKD1H223ZF	C 705	ECKD1H102KB	D 515	LN41YPHL
R 15, 16 ERD25FJ472	R 140 ERD25	FJ562		C 11, 12	ECEA1AS221	C 148	ECKD1H392KB			1	
R 17, 18 ERD25FJ562	R 141 ERD25		ERD25TJ473	C 13, 14	ECQM1H123JZ	C 201, 202	ECEA25Z4R7	COMBIN	NATION PARTS	D 516	LN31GPHL
R 19, 20 ERD25TJ225	R 142 ERD25		ERD25TJ223	C 15, 16	ECCD1H181K	C 203, 204	ECEA50Z1			D 517	LN21RPHL
R 21, 22 ERD25FJ332	B 440 EBB05	R 310 TJ154 R 311	ERD25TJ104	C 17, 18	ECQM1H152JZ	C 205 206 /	007 000	Z 501	EXBEQ5273K	D 702 D 703	TLR208 TLG208
R 23, 24 ERD25TJ225	R 143 ERD25 R 144 ERD25		ERD25TJ473 ERD25FJ183	C 19, 20	ECQM1H123JZ	C 205, 206, 2	ECQV05104JZ	Z 502 Z 503	EXBD86181K EXBEQ4272K	D 704	TLY208
R 25, 26 ERD25FJ101	R 145 ERD25		ERD25FJ182	C 21, 22, 23	24	C 209, 210	ECQV0510432 ECQV05334JZ	Z 504	QCRFWA1	10 704	121200
R 29, 30 ERD25FJ103	R 146 ERD25		ERD25FJ102	0 21, 22, 20	ECESA50Z1	C 212	ECCD1H221K	Z 505	EXFP4472Z	INTEGRA	TED CIRCUITS
R 31, 32 ERD25FJ681	R 147 ERD25		ERD25FJ103	C 25, 26	ECKD1H392KB	C 213, 214	ECQM1H103JZ	Z 506	EXBD8825K		
R 33, 34 ERD25FJ100	R 148 ERD25	FJ332 R 318	ERD25FJ472	C 27, 28	ECEA1AS470	C 215	ECCD1H103JZ	Z 507	EXRP152K473	IC 1	AN6212
R 35, 36 ERD25FJ182	R 149 ERD25		ERD25TJ154	C 29, 30	ECEA50M1R	C 216	ECCD1H101KC			IC 2	MA6212
R 37, 38 ERD25FJ472	R 150 ERD25	FJ822		C 31, 32	ECKD1H103ZF	C 217, 218	ECQM1H103JZ	TRA	NSISTORS	IC 3, 4	NE646N
R 39 ERD25FJ561	R 151 ERD25		ERD25TJ683	C 33, 34	ECEA16M10R	C 219, 220	ECCD1H101KC			IC 5, 6	AN6213
R 40 ERD25FJ822	R 152 ERD25	TJ563 R 323, 324	ERD25TJ563	C 35, 36	ECEA1AS221	C 221	ECEA25Z4R7	Q 1, 2	2SD636R	IC 7	AN6256
R 41, 42 ERD25TJ123	R 153 ERD25	R 325, 326 FJ471 R 327, 328	ERD25TJ224	C 37, 38 C 39, 40	ECQV05334JZ	C 221	ECCD1H221K	Q 3 Q 11, 12, 13	2SB641R	IC 8 IC 9	AN6214 BA336
R 43, 44 ERD50FJ151	R 153 ERD25 R 154 ERD25		ERD25FJ222 ERD25FJ562	C 41, 42	ECQM1H392JZ ECQM1H472JZ	C 222, 223, 2	224	Q 11, 12, 13	2SK104F	IC 201, 202	UPC1252H
R 45, 46 ERD25FJ102	R 155, 156 ERD25		ERD25TJ473	0 41, 42	ECQWITH4/2JZ	0 222, 223, 2	ECEA25Z4R7	Q 15, 16	2SD965	IC 203, 204	UPC1253H2
R 47, 48 ERD25TJ274	R 157, 158 ERD25		ERD25TJ104	C 43, 44	ECEA1HS100	C 225, 226, 2		Q 17, 18	2SD965	IC 205, 206	NJM4558DF
R 49, 50, 51, 52	R 159, 160 ERD25		ERD25TJ224	C 45, 46	ECQM1H273JZ	,, -	ECQV05104JZ	Q 19	2SA921S	,	
ERD25TJ105	R 161 ERD25		ERD25TJ473	C 47, 48	ECEA1HSR33	C 229, 230, 2		Q 21, 22, 23	2SD1011S	IC 301	AN6870N
R 53, 54 ERD25TJ473	R 162 ERD25	FJ101 R 336	ERD25FJ332	C 49, 50	ECQM1H104JZ		ECQM1H332JZ	Q 25	2SA683R	IC 302, 303	AN6280
R 55, 56 ERD25FJ332	R 163, 164 ERD25			C 51, 51	ECEA1HS100	C 233, 234	ECCD1H331K	Q 26	2SD946	IC 304	NJM4556D
R 57, 58 ERD25TJ274	R 165, 166 ERD25		ERD25FJ562	C 53, 54	ECFDD473KXY	C 235, 236	ECQV05104JZ	Q 27	2SD592NCR	IC 305	BA6138
R 59, 60 ERD25TJ184	R 167 ERD25		▲ ERD25FJ102	C 55, 56	ECEA1AS471	C 237, 238	ECQM1H103JZ	Q 28, 29	2SC945P	IC 501	MN1405RH
R 61, 62 ERD25FJ332	D 160 160 FDD05		ERQ12HJ2R7P	C 57, 58 C 59, 60	ECQM1H562JZ ECQV05224JZ	C 239, 240	ECQM1H102JZ ECEA16M10R	Q 30 Q 31	2SD636R 2SC945P	IC 502 IC 503	AN6270 DN6838A
R 63, 64 ERD25FJ181	R 168, 169 ERD25 R 170 ERD25		★ ERD25FJ102 ERD25FJ471	C 61, 62, 63		C 241, 242 C 243, 244	ECEATHS100	Q 32	2SA722-S	IC 701	M54816P
R 65, 66 ERD50FJ101	R 171 ERQ12		ERD25FJ391	0 01, 02, 00,	ECEA1HS100	C 245	ECQM1H102JZ	Q 33	2SC945P		
R 67, 68 ERD25TJ223	R 201, 203 ERD25		ERD25FJ332					Q 34, 35, 36			
R 69, 70 ERD25TJ154	R 205, 206 ERD25	=J101 R 407	ERD25FJ472	C 65, 66	ECEA1EN3R3	C 247, 248	ECEA1ES470	Q 37, 38	2SC945P		
R 71, 72 ERD25FJ102	R 207 ERD25		ERD25FJ103	C 67, 68	ECQV05154JZ	C 249, 250	ECCD1H151KC	Q 39, 41, 42		1	
R 73, 74 ERD25FJ392	R 208 ERD25		▲ ERD25FJ102	C 69, 70	ECESA50Z1	C 301	ECFD104KXY	Q 201, 202	2SK104F	1	
R 75, 76 ERD25FJ681	R 209, 210 ERD25			C 71, 72	ECEA50Z2R2	C 302	ECFDD223KXY	Q 203, 204	2SC945P	1	
R 77, 78 ERD25FJ820 R 79, 80 ERD25FJ392	R 211, 212 ERD25		ERQ12HJ2R7P	C 73, 74	ECQM1H273JZ	C 303, 304	ECEA50Z1	0.005	00040400	1	
R 79, 80 ERD25FJ392 R 81, 82, 83, 84	R 213, 214 ERD25	TJ473 R 411 Z R 412	≜ ERD25FJ102 ERD25FJ103	C 75, 76	ECQM1H682JZ	C 305, 306 C 307, 308	ECEA50ZR47 ECEA1HS100	Q 205	2SD1010R 208, 209, 210, 211,	1	
ERD25FJ152	R 215, 216 ERD25		ERD25TJ823	C 77, 78	ECQM1H153JZ	C 307, 308	ECEATES101		214 215, 216, 217,	ľ	
	R 217, 218 ERD25		ERX2ANJ5R6	C 79, 80	ECQM1H333JZ	C 310	ECFDD473KXY	218, 219,		1	
R 85, 86 ERQ12HJ270	R 219, 220 ERD25		ERD25FJ102	C 81, 82	ECQM1H683JZ	C 311	ECKD1H682MD	210, 210,	2SD1010R	1	
R 87, 88 ERD25FJ562	R 221, 222 ERD25	J103 R 416	ERD25FJ103			1		Q 221, 222,	223	1	
R 89, 90 ERD25FJ682	R 223, 224 ERD25	ΓJ473 R 417 Δ	▲ ERD25FJ821	C 83	ECEA1CS221	C 401 🛕	ECEA1ES332		2SC945P	I	
R 91, 92 ERD25FJ821	R 225, 226 ERD25		ERD50FJ331	C 84	ECEA1CS471	C 402 🛕	ECEA1ES101	Q 225	2SA564R	1	
R 93, 94 ERD25TJ473	R 227, 228 ERD25		ERD25FJ121	C 85, 86	ECQV0568JZ	C 403	ECKD1H103ZF	Q 227	2SC945P	1	
R 95, 96 ERD25FJ820 R 97, 98 ERD25FJ560	R 229, 230 ERD25		EDDEOF 1994	C 87, 88	ECEA1ES220	C 404	ECEA1ES220 ECEA1CS331	Q 301, 302	2SD636R	I	
R 97, 98 ERD25FJ560 R 101 ERD25FJ222	R 231, 232 ERD25	TJ473 R 420 R 421	ERD50FJ331	C 89; 90 C 91, 92	ECKD1H102KB ECQM1H392JZ	C 405 C 406	ECEATOS331 ECKD1H103ZF	Q 303 Q 304	2SB641R 2SA564R	1	
R 102 ERD25TJ224	R 233, 234, 235, 236 ERD25		ERD25TJ104 ERD25TJ223	C 91, 92 C 93, 94	ECKD2H121K		ECEA1ES222	G 304	23A304A	1	
R 103 ERD25TJ473	LINDZS	R 423	ERD25TJ123	C 95, 96	ECCD1H101KC	C 408 🛕		Q 401	2SD836Q	1	
	R 237, 238 ERD25		ERD25FJ560	C 97	ECEA1AS101	C 409	ECKD1H103ZF	Q 402	2SC945P	1	
R 104 ERD25TJ563	R 239, 240 ERD25		ERD50FJ271	C 98	ECEA1HS100	C 410	ECEA50Z1	Q 403	2SA564R	1	
R 105 ERD25FJ472	R 241 ERD25	J102 R 428	ERD25FJ392			1		Q 404	2SB895R	1	
R 106 ERD25TJ473	R 242 ERD25	FJ102 R 429	ERD25FJ562	C 99	ECEA50ZR47	C 411	ECEA1CS331	Q 405	2SD946		
R 107 ERD25TJ273	R 243, 244 ERD25		ERD25TJ683	C 100	ECEA1HS100	C 412	ECKD1H103ZF	Q 406	2SC945P		
R 108 ERD25FJ472	R 245, 246 ERD25		ERD25FJ222	C 101, 102	ECEA1CS330	C 413	ECQP1103JZ	Q 407	2SD592NCR		
R 109, 110 ERD25TJ473 R 111 ERD25TJ104	R 247, 248 ERD25		EDD05E 1004	C 103, 104	ECFDD223KXY	C 414 A		Q 408	2SA683R		
1111 ERD25TJ104 1112, 113, 114, 115	R 249, 250 ERD25		ERD25FJ221	C 105, 106	ECEA1HS100	C 415, 416 <u>∧</u> C 417, 418 <u>∧</u>	ECEA1CS472	Q 501, 502,	503, 504, 505 2SB643R		
ERD25TJ473	R 251, 252 ERD25 R 253, 254 ERD25		ERD25FJ331 ERD25FJ471	C 107 C 108	ECEA1HF100 ECQM1H822KZ	C 417, 418A	ECEA1HS100 ECKD1H103ZF	Q 506	2SD636R	1	
116 ERD25FJ562	11 230, 234 END231	R 706	ERD25FJ331	C 108	ECKD1H103ZF	C 420	ECQP1103JZ	1 300	20D000N	1	
117 ERD25TJ223	R 255, 256 ERD25		LIID201 0001	C 110	ECFDD153KXY	C 421	ECEA1ES470	Q 508	2SD965		
	R 257, 258 ERD25		LE RESISTORS	C 111	ECQP1H153JZ	C 422	ECEA1ES220				
118 ERD25TJ224	R 259, 260 ERD25			1		_		DIODES	& RECTIFIERS	1	
119 ERD25FJ152	R 261, 262 ERD25	rJ333 VR 1, 2	EWJ5SAF22A24	C 112	ECEA1HSR33	C 423	ECEA1ES470			ı	
R 120 ERD25TJ273	B 263 264 EBD25		OWKGTA024A54	I C 113	ECESA50Z1	C 424	ECEA1ES220	D 1, 2, 11, 1;	2. 13. 14. 15	I	

ECESA50Z1 ECEA50ZR22

ECEA1HS100 ECEA25Z4R7

ECEA1CS330 ECQM1H104JZ

ECKD1H103ZF ECKD1H103ZF

C 114 C 115 C 116 C 117 C 118, 119

Δ

QWKGTA024A54 EVNM4AA00B24

EVNM0AA00B14 C 120 EVNM4AA00B24 C 131

VR 5, 6 EVNM4AA00B24 VR 7, 8, 9, 10 EVNM4AA00B15 VR 201, 202, 203, 204 EVNM0AA00B54 VR 205, 206, 207, 208

ECEA1ES220 ECFDD104KZY

ECEA50Z3R3 ECFDD104KZY ECEA1CS472 ECKD1H102MD

ECCD1H331K ECEA1AS221

D 1, 2, 11, 12, 13, 14, 15 MA161

MA161 D 16 RVDRD6R2EB D 17, 18, 19, 20, 21, 22, 201, 202, 203, 204, 301, 302, 303, 305, 306

MA161 D 401, 402, 403, 404, 405, 406,

Ref No.	Part No.	Part Name & Description				
RESONATOR						
X 701	QZE0049	Crystal				
COILS						
L 1, 2 L 3, 4 L 5, 6 L 7 L 8 L 501 L 502, 503	QLQX0332KWA QLQX0343KWA QLM9Z9K QLB0198KA QLQX0332KWA ELEH101KA QLQX1014D	Peaking Coil Bias Trap Coil MPX Filter Bias Oscillation Coil Peaking Coil Choke Coil Choke Coil				
	TRANSFORMER					
T 401 🔬	QLPD66EMX	AC Power Transformer				
	FUSES					
F3 4	\( \text{XBAQ0008} \) \( \text{XBAQ125028} \) \( \text{XBAQ0006} \) \( \text{SWITC}	Fuse (T630mA) Fuse (T1.25A) Fuse (T315mA) CHES				
S 1	QSR8402	Rotary Switch (NR Selector)				
S 401 👲		Push Switch (Power ON/OFF) Rotary Switch				
S 501, 502,	503, 504, 505, 506, 50					
S 509, 510,		Key Board Switch				
S 513	QSWY409 QSS1303	Push Switch Slide Switch (Timer Switch)				
S 601	QSB0260	Leaf Switch				
S 602	QSB0260	(Erase Safety Switch) Leaf Switch (Mode Sensing Switch)				
S 603	QSB0261	Leaf Switch (Stop Switch)				
S 604 S 605	QSB0260 QSB0261	Leaf Switch (Playback Switch) Leaf Switch				
S 606, 607	QSB0266	(Half Detection Switch) Leaf Switch (Auto Tape Selector)				
	JAC	CKS				
J 1 J 2	QJA0259 QJA0262	Headphones Jack Microphone Jack				

R 275, 276 ERD25TJ333

ERD25TJ333 ERD25FJ682

ERD25FJ472 ERQ12HJ220

ERD25TJ393 ERD25TJ473

ERD25FJ332

VR 3, 4 VR 5, 6

ERD25TJ273

ERD25TJ104 ERD25FJ101

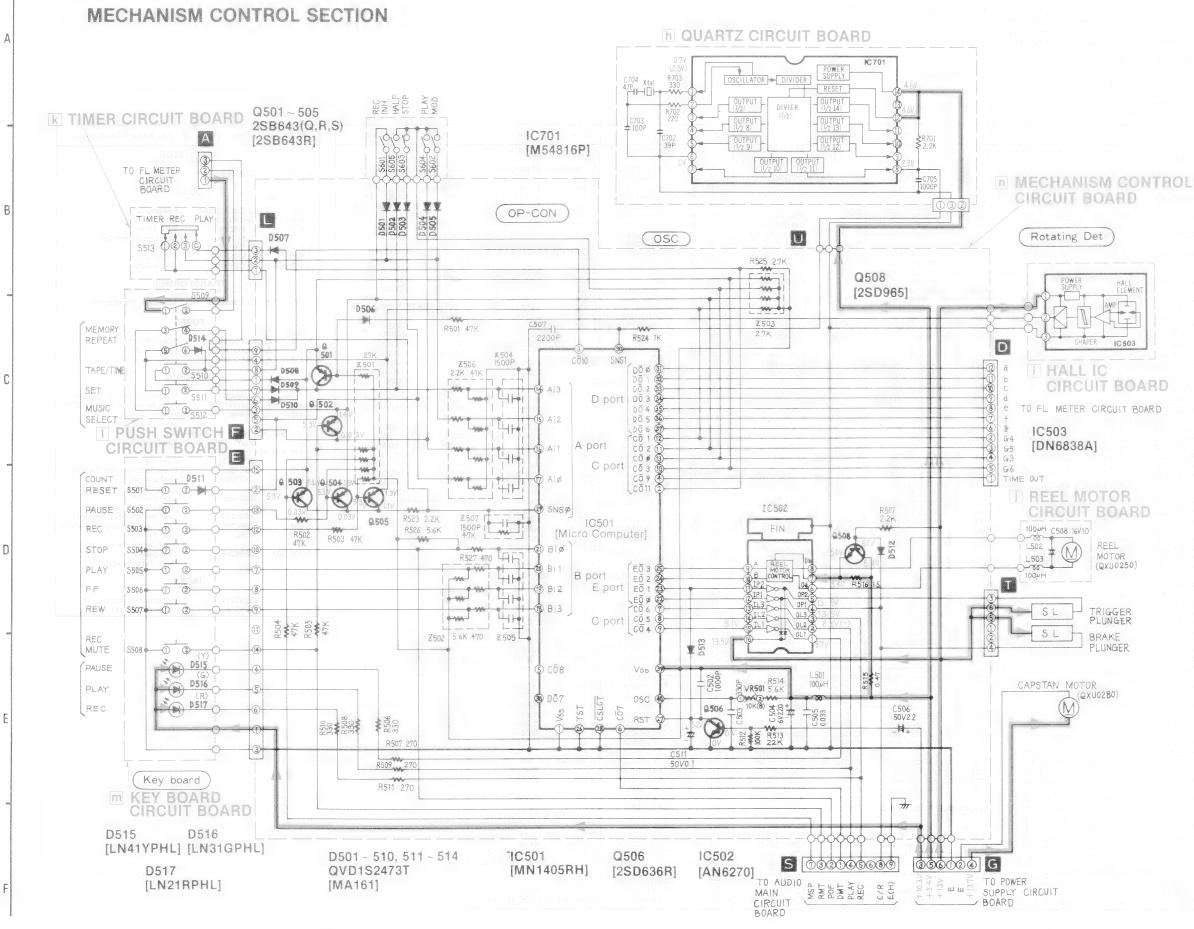
ERD25FJ391

R 121, 122, 123 ERD25TJ473

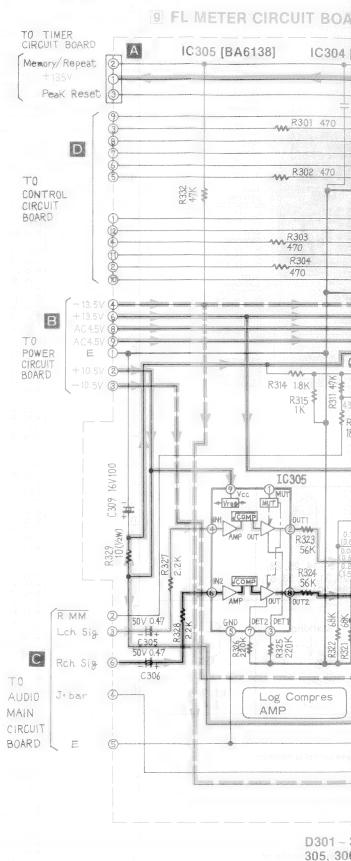
R 124 R 125 R 126 R 127, 128 R 129

R 259, 260 R 261, 262 R 263, 264 R 265, 266 R 267, 268 R 269, 270 R 271, 272 R 273, 274

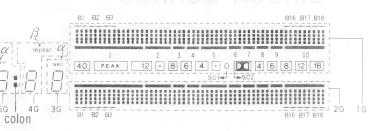
# SCHEMATIC DIAGRAM

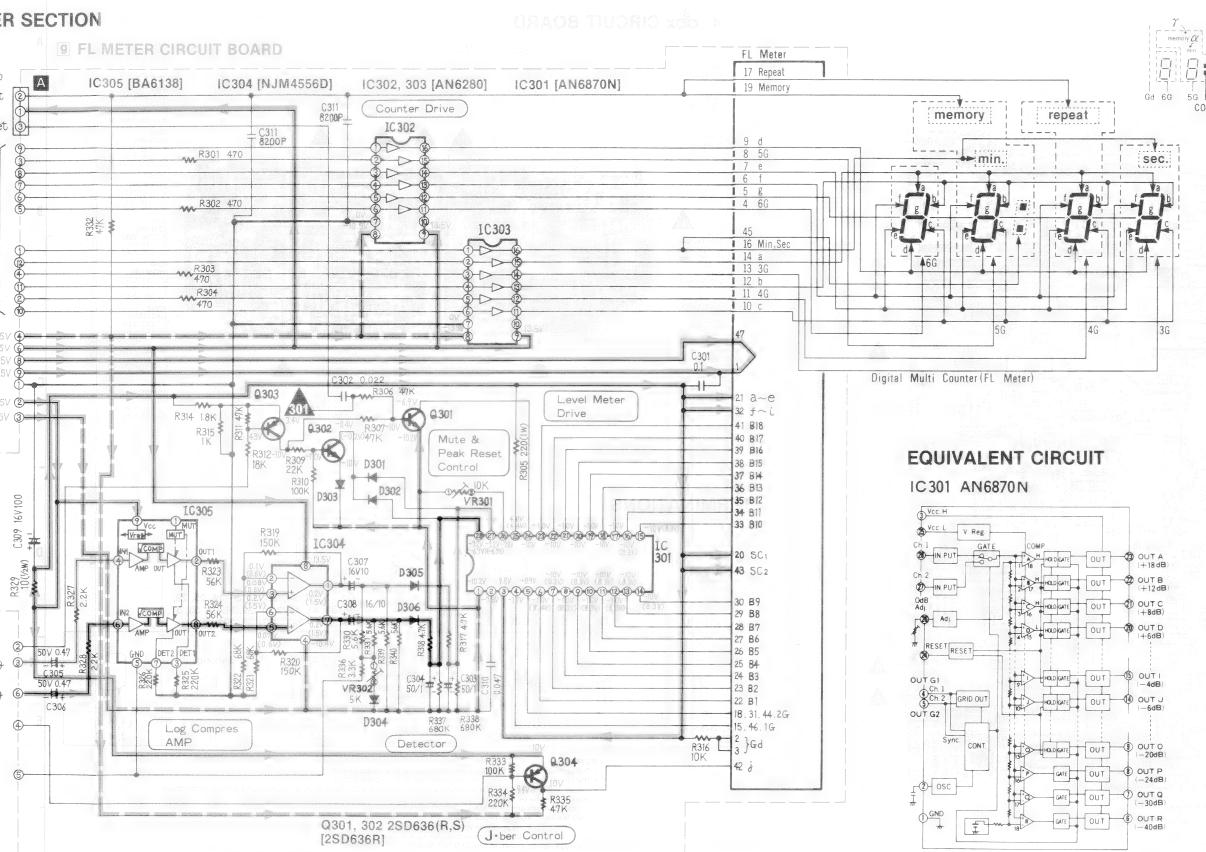


## FL METER SECTION



#### **GRID TERMINATION (FL METER)**





Q303 2SB641(R,S)

[2SB641R]

Q304 2SA564(R,S,T)

[2SA564R]

NOTES: . FL meter adjustment VR (For 0 dB indication) • VR301. . FL meter adjustment VR (For -40 dB indication) VR501 Input scanning time adjustment VR Counter reset switch · S502 . Pause switch · S504 Stop switch

• S507 Rewind switch . Record mute switch . Memory repeat switch · S508 · \$510 . Tape/Time select switch Set switch · S512 Music select switch

· S506

Playback switch

. Fast Forward switch

Timer switch (shown in REC position: (1) REC, (2) OFF, (3) PLAY) . Accidental erase prevention switch . Mode switch · S601 · S602 Mode sensing · S603. Stop switch · S604 Playback switch

• S605 . . . . Cassette detection switch
• Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω). • Capacity are in microfarads (μF) unless specified otherwise.

P = Pico-farads.

• The mark (♥) shows test point. e.g. ♥ = Test point 1.

 All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltae in record mode is indicated in ( ) when it differs from that in record mode. For measurement, use VTVM.

number when they are identical.

e.g. Q1 2SC1844(E,F) ◀─ Production parts number [2SC1844E] ■ Supply parts number QVD1S2473T - Production parts number [MA161] Supply parts

- The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.

D304 1S2473FV

[MA161]

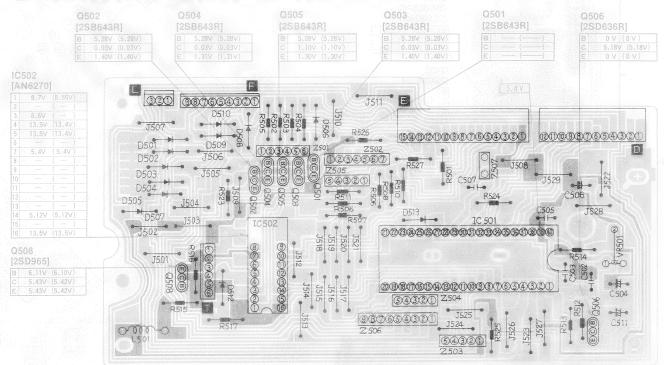
D301~303 QVD1S2473T

305, 306 [MA161]

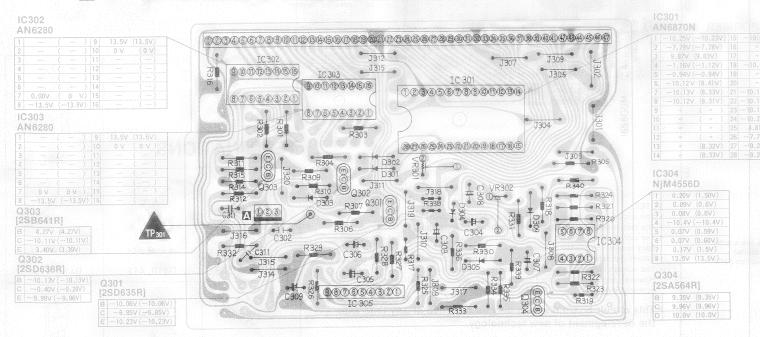
# CIRCUIT BOARDS

CIRCUIT BOARDS

### n MECHANISM CONTROL CIRCUIT BOARD



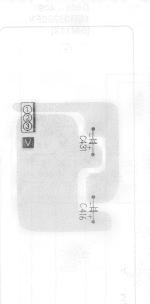
## 9 FL METER CIRCUIT BOARD

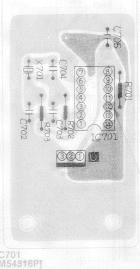


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NAPOAIG OITAMBHOS

## h QUARTZ CIRCUIT BOARD





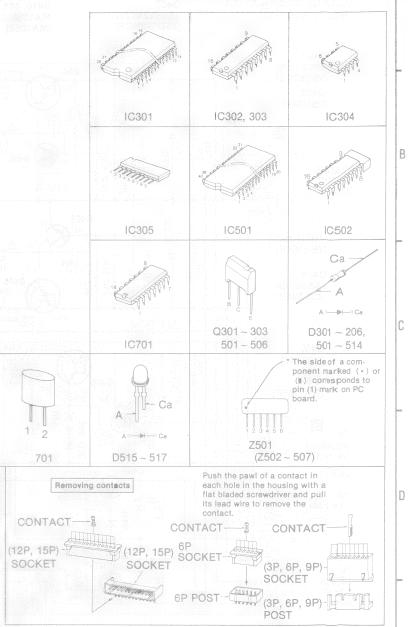
	- (0.80V)		2.27V (2.27V)
	0.72V (0.72V)		
4			
			4.56V (4.57V)
	0 V (0 V)		
		14	4.56V (4.57V)

Committee of the second of the

The supply performance is decided again in the replacement
 This schematic diagram may be modified at an entire technology.

With the dependent at your factorization.

### **TERMINATIONS**



#### NOTES:

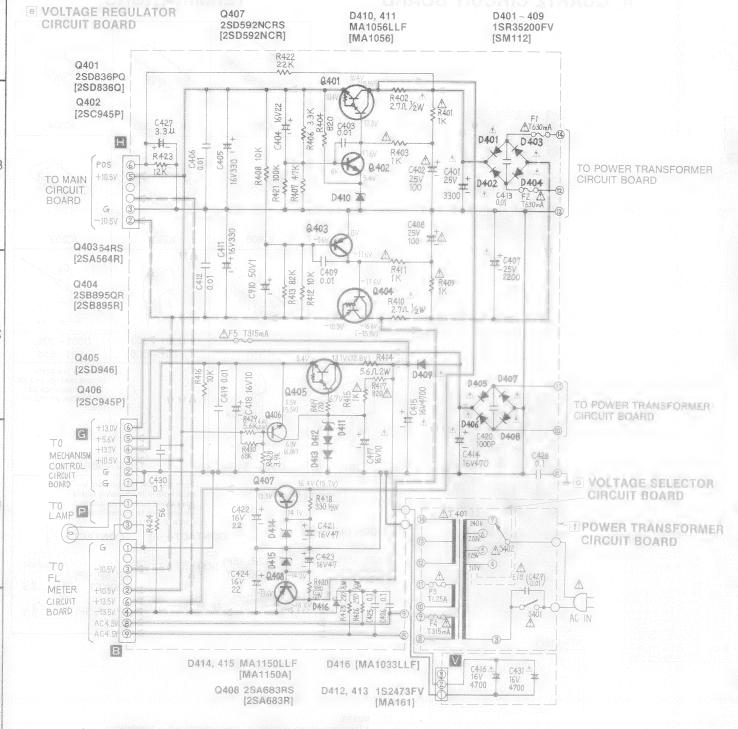
- The circuit shown in second on the conductor is B + (bias) circuit.
- The circuit shown in \_\_\_\_\_ on the conductor is B − (bias) circuit.

  Values indicated in \_\_\_\_ are under no signal condition and playback mod with volume control at minimum position otherwise specified.

  However, the voltage in record mode is indicated in ( )

  For measurement use VTVM
- This circuit board diagram may be modified at any time with the development of new technology.

## SCHEMATIC DIAGRAM POWER SUPPLY SECTION



- \$401.... Power ON/OFF switch.
   \$402.... AC power voltage select switch
   Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.

  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
   Capacity are in microfarads (μF) unless specified otherwise.

  P = Pico-farads. · All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position However, the voltage in record mode is indicated in (For measurement use VTVM.

  ( ( ) indicates B + (bias).

  ( ( ) indicates B - (bias).

 Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes.

One type of number is used for supply parts number and production parts number when they are identical.

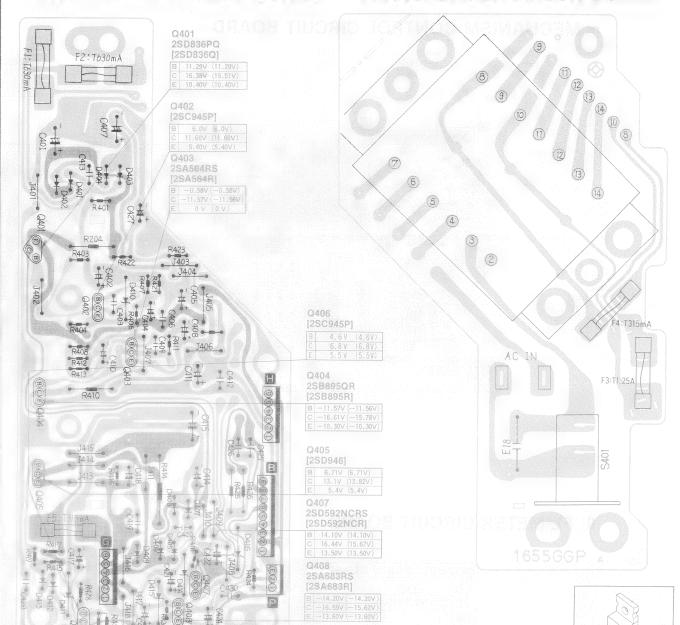
2SC1844(E,F) - Production parts number [2SC1844E] Supply parts number

QVD1S2473T Production parts number

- [MA161] Supply parts • The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.

## **CIRCUIT BOARDS** POWER SUPPLY CIRCUIT BOARD

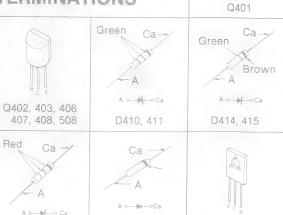
## TRANSFORMER CIRCUIT BOARD



#### NOTES

- The circuit shown in on the conductor is + B (bias) circuit
- The circuit shown in \_\_\_\_\_ on the conductor is -B (bias)circuit.
  The circuit shown in \_\_\_\_\_ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in \_\_\_\_\_ are DC voltage between the ground and electrical parts. The voltage indicates are measured during playback mode.
- However, the voltage in record mode is indicates in ( ) when it differs from that
- This circuit board diagram may be modified at any time with the development of new technology.

# **TERMINATIONS**



D401~409

Q404, 405

# **SCHEMATIC DIAGRAM MAIN SECTION**

# dbx SEC

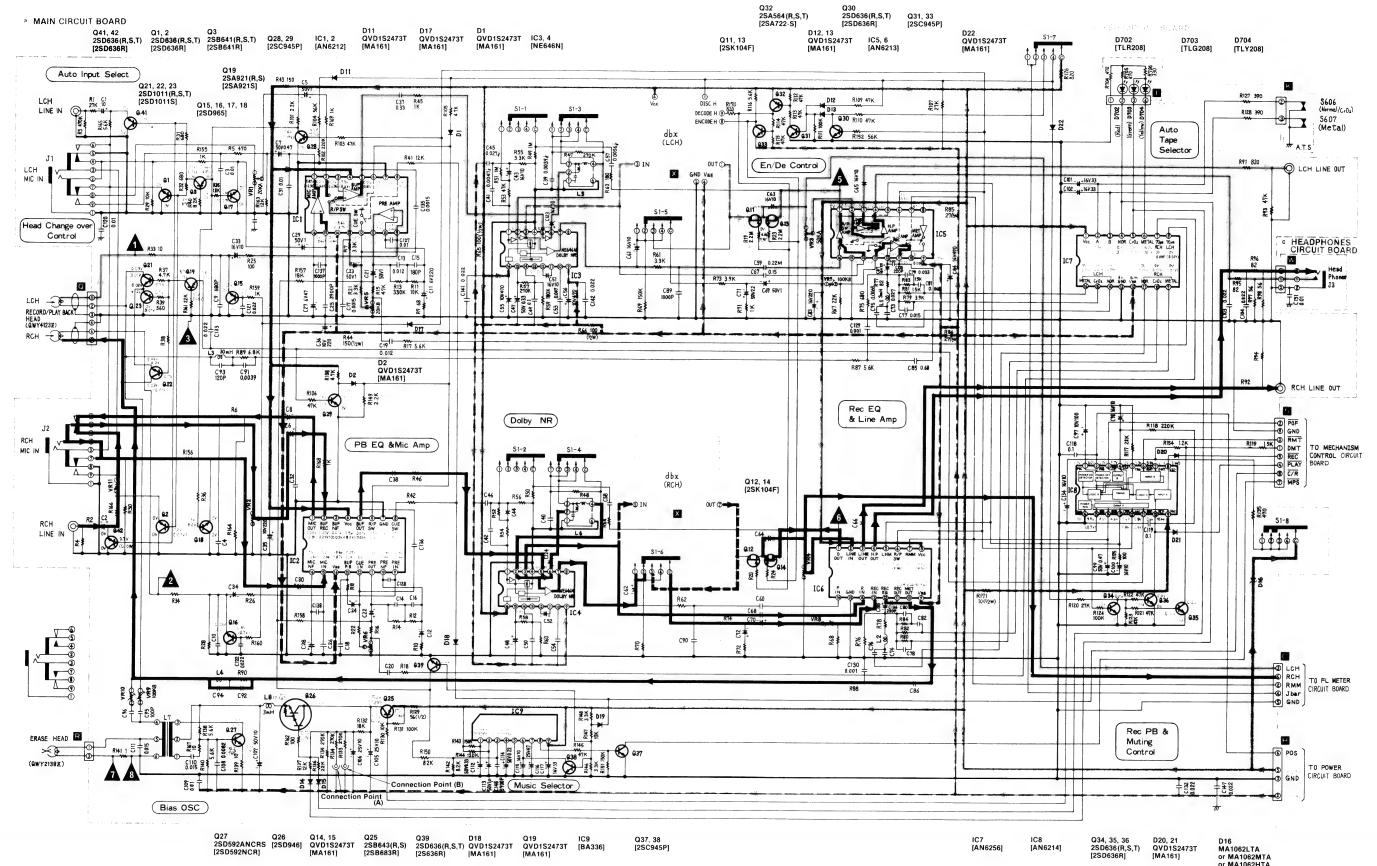
dbx CIRCUIT B

(m) disc (H)

TO MAIN

Q205 2SD1010(R,S) [2SD1010R]

TO MAIN CIRCUIT BOARD



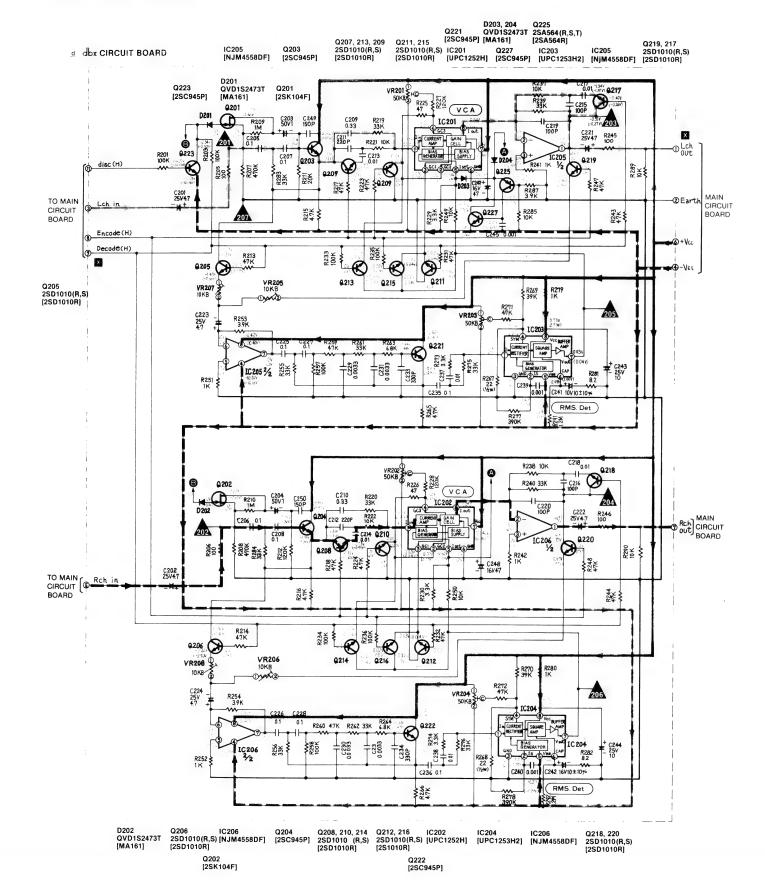
RCH LINE OUT

RMT DMT TO MECHANISM CONTROL CIRCUIT BOARD

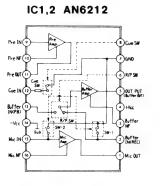
TO POWER

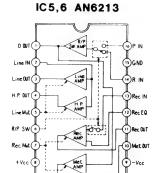
+10.5V

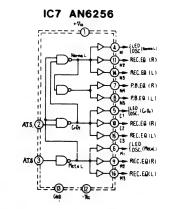
# dbx SECTION

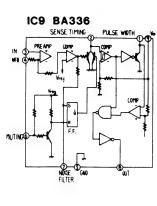


### **EQUIVALENT CIRCUITS**









■ Truth table of IC1, 2 (Postive)

#### R / P SW

6 pin	Operation
Н	REC
L	PВ

SW-1, SW-2

6 pin	Operation
Н	
L	Mute

#### Cue SW

<pre>8pin</pre>	Operation
Н	
L	Cue

■ Truth table of IC5, 6 (Positive)

#### R/P SW

6 pin	Operation
Н	REC-
L	PB

#### Muting

5, <b>7</b> Pin	Operation		
Н	Muting OFF		
L	Muting ON		
	L . CND Laval		

NOTES:

. . NR select switch (shown in OUT position: (1) Dolby NR,

(2) OUT, (3) dbx tape, (4) dbx disc)

Auto tape select switch (For Normal/CrO<sub>2</sub> tape) S607 . Auto tape select switch (For Metal tape)

Mode	S606	S607	
Normal	on	on	
CrO₂	on	off	
Metal	off	off	

- . Input level controls.
- VR3, 4....
- . Output level control.
  . Playback gain adjustment VR. • VR7 8

- Recording gain adjustment VR.
  Bias current adjustment VR.
  VCA symmetry adjustment VR.
  RMS detector adjustment VR. VR201, 202.
  VR203, 204.
- VR205, 206. . dbx standard level adjustment VR (Encode)
- VR207, 208. . dbx standard level adjustment VR (Decode)
- Resistance are in ohms  $(\Omega)$ , 1/4 watt unless specified otherwise. 1K = 1,000  $(\Omega)$ , 1M = 1,000 k  $(\Omega)$
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (♥) shows test point. e.g. v = test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified
- Voltage values shown in MAIN SECTION.
   NO MARK.... Voltage values at out (NR select switch) mode
   ....... Voltage values at record mode.

- Voltage values at record mode.

  Voltage values at disc (NR select switch) mode

  Voltage values shown in dbx SECTION.

  Voltage values at out (NR select switch) mode.

  Voltage values at disc (NR select switch) mode.

  For measurement use VTVM.

number when they are identical.

- parts number and production parts number for transistors and diodes.

  One type of number is used for supply parts number and production parts
- e.g. Q1 2SC1844 (E, F) ← Production parts number [2SC1844E] ← Supply parts number
- [MA161] 

  Supply parts numbers

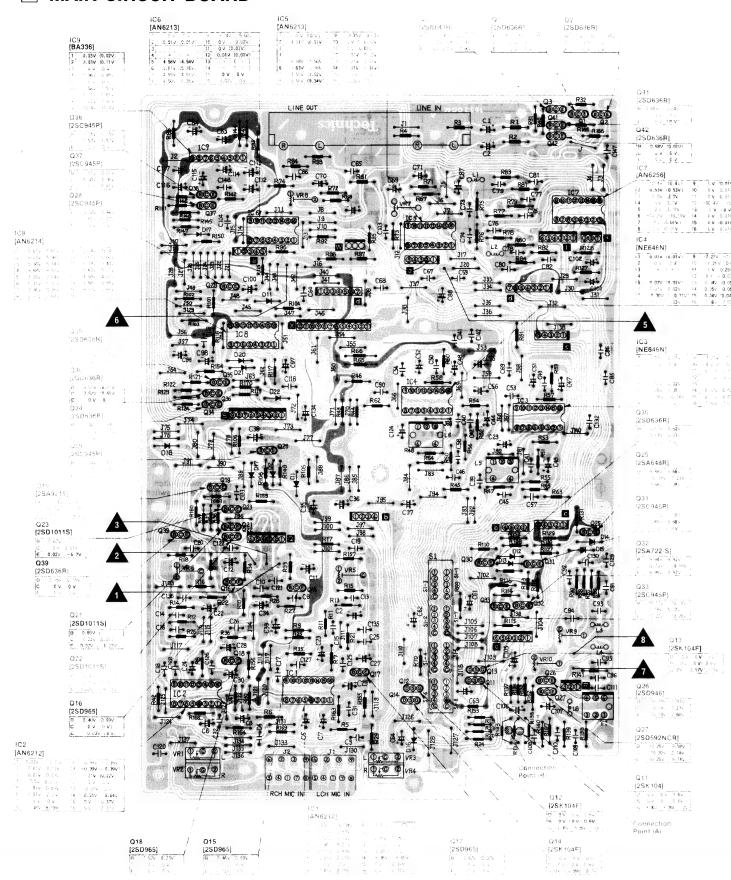
   The supply parts number is described alone in the replacement parts list.
- This schematic diagram may be modified at any time with the development of new technology.

\* Input level controls · · · MAX SPECIFICATIONS \* Output level control · · · MAX

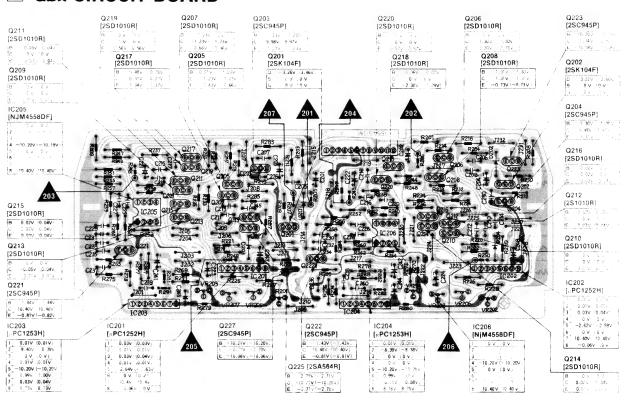
Playback S/N ratio  * Test tape ··· QZZCFM	Greater than 45dB
Overall distortion  * Test tape  QZZCRA for Normal  QZZCRX for CrO <sub>2</sub> QZZCRZ for Metal	Less than 4%
Overall S/N ratio  * Test tape ··· QZZCRA	Greater than 43dB (without NAB filter)

## **CIRCUIT BOARDS**

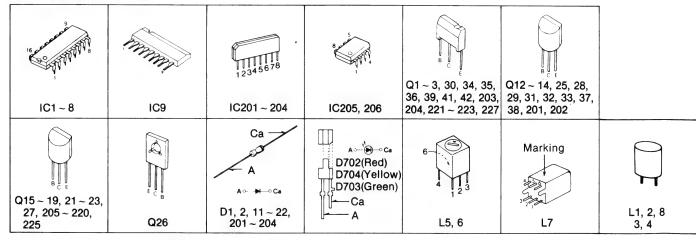
## **a MAIN CIRCUIT BOARD**



# dbx CIRCUIT BOARD



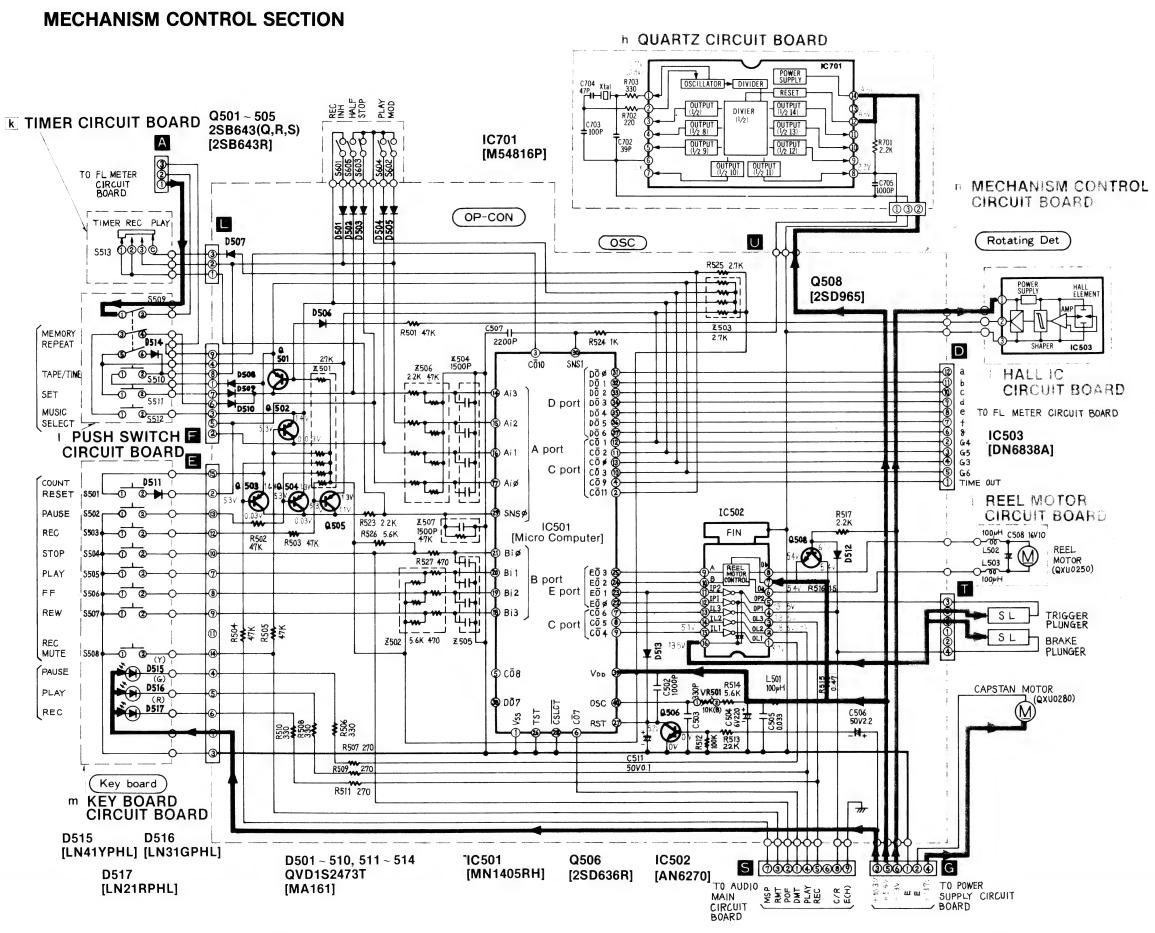
### **TERMINATIONS**



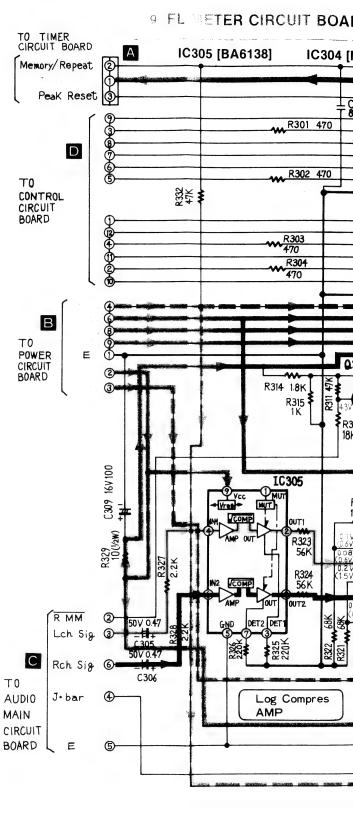
- The circuit shown in on the conductor is B + (bias) circuit.
  The circuit shown in on the conductor is B (bias) circuit.
  Values indicated in are under no signal condition and playback mode with volume control at minimum position otherwise specified.

  • Voltage values shown in MAIN CIRCUIT BOARD
- NO MARK. . . Voltage values at Out (NR select switch) mode
- l. . . . . . Voltage values at record mode
  [ ]. . . . . Voltage values at disc (NR select switch) mode
   Voltage values shown in dbx CIRCUIT BOARD
- NO MARK. . . Voltage values at dbx tape (NR select switch) mode
- ( )...... Voltage values at Out (NR select switch) mode. For measurement use VTVM.
- This circuit board diagram may be modified at any time with the development of new technology.

## **SCHEMATIC DIAGRAM**



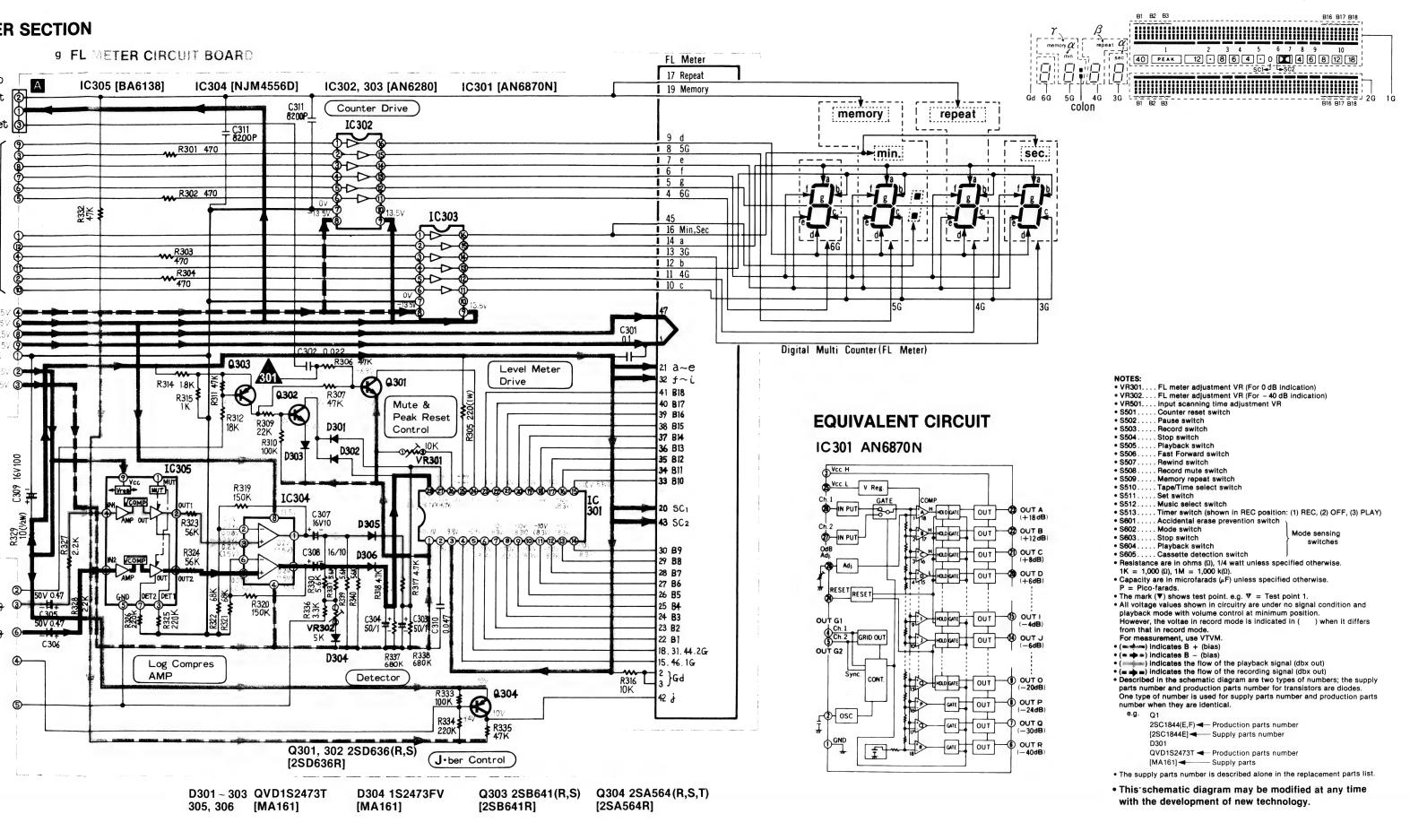
## FL METER SECTION



D301 ~ 3 305, 306

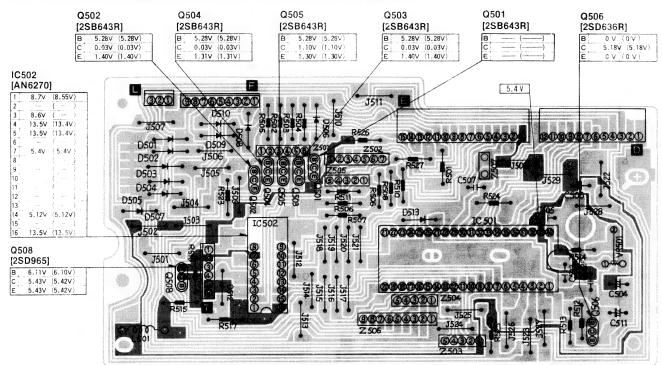
#### **GRID TERMINATION (FL METER)**

15

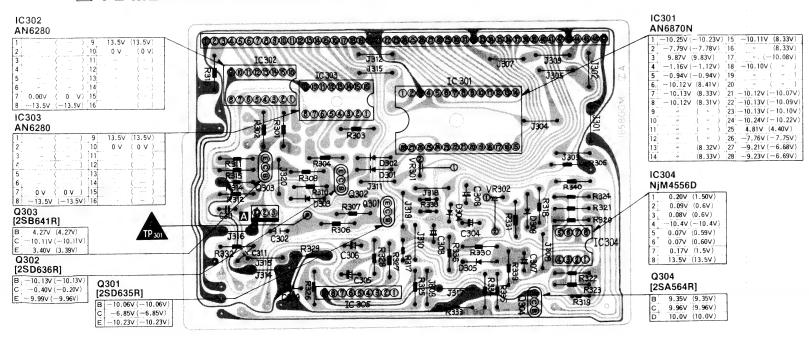


## **CIRCUIT BOARDS**

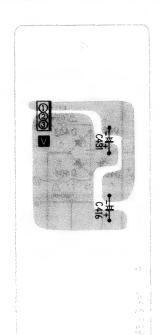
## **n MECHANISM CONTROL CIRCUIT BOARD**

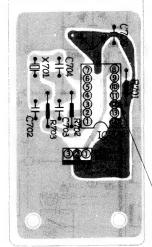


## **9 FL METER CIRCUIT BOARD**



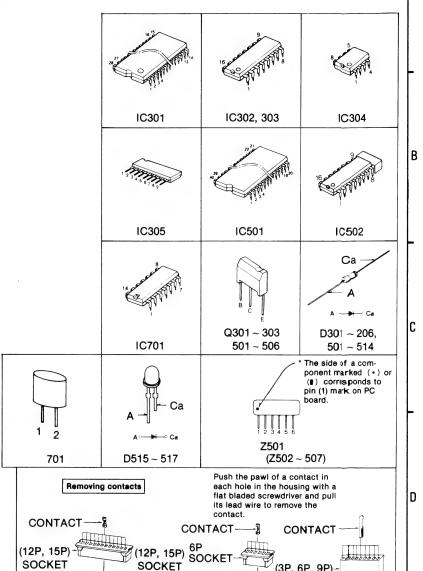
## h QUARTZ CIRCUIT BOARD





1	-	(0.80V)	8	2.27V	(2.27V
2	0.72V	(0.72V)	9		(
3		( )	10		(
4		( )	11		(
5		( )	12	4.56V	(4.57V
6	0 V	( 0 V )	13		(
ź"		( )	14	4.56V	(4.57V

### **TERMINATIONS**



• The circuit shown in some on the conductor is B + (bias) circuit.

SOCKET

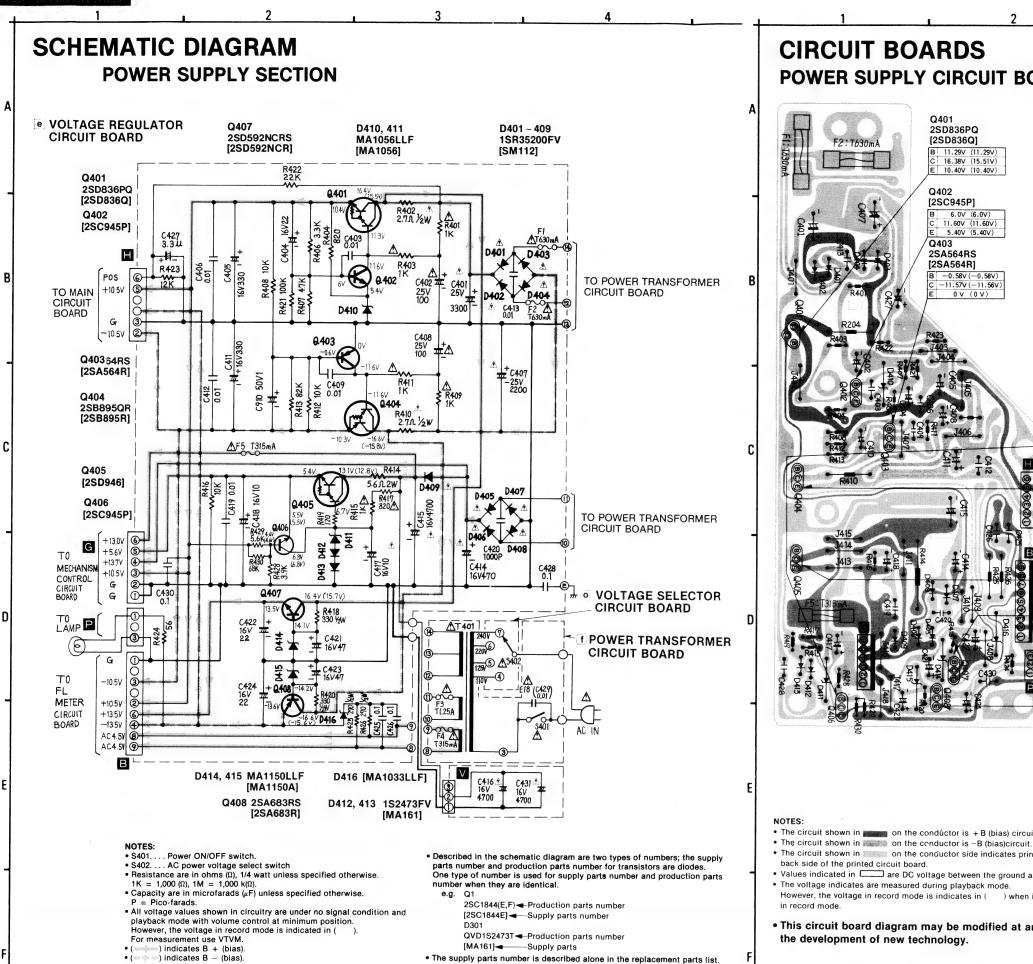
control at minimum position otherwise specified. However, the voltage in record mode is indicated in (
For measurement use VTVM

(3P, 6P, 9P)-SOCKET

POST

6P POST (3P, 6P, 9P)

• This circuit board diagram may be modified at any time with the development of new technology.

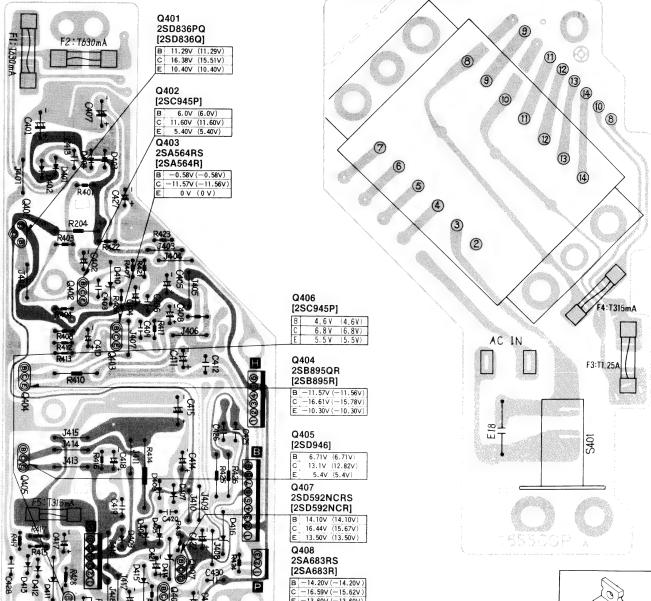


• This schematic diagram may be modified at any time

with the development of new technology.

**POWER SUPPLY CIRCUIT BOARD** 

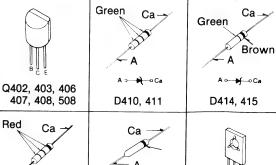
## TRANSFORMER CIRCUIT BOARD



# **TERMINATIONS**

## • The circuit shown in on the condúctor is + B (bias) circuit.

- The circuit shown in an on the conductor side indicates printed circuit on the
- Values indicated in \_\_\_\_\_ are DC voltage between the ground and electrical parts.
- However, the voltage in record mode is indicates in ( ) when it differs from that
- This circuit board diagram may be modified at any time with



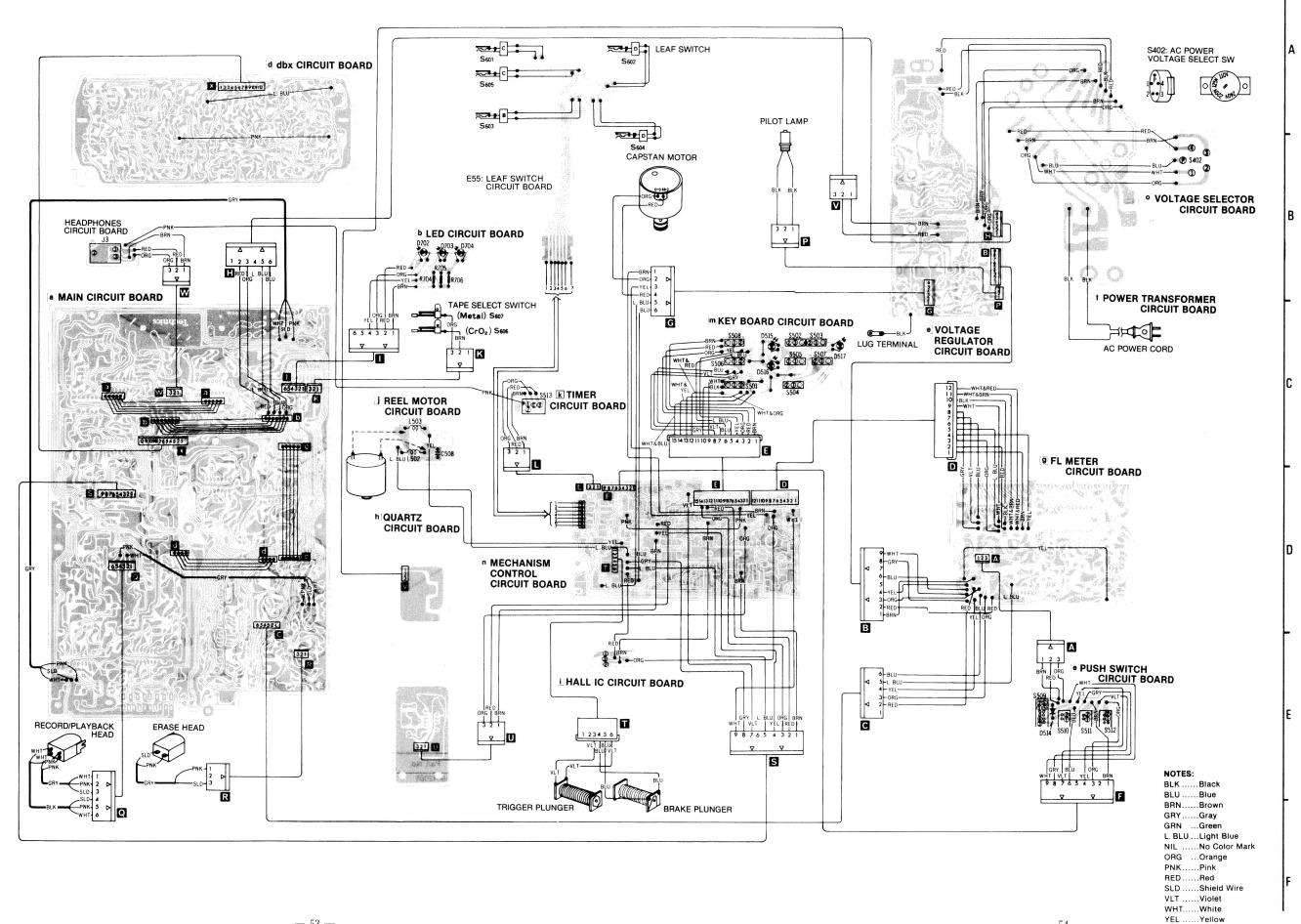
D401 ~ 409

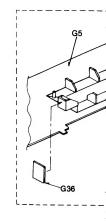
Q401

Q404, 405

D416

## WIRING CONNECTION DIAGRAM







#### REPLACEMENT PARTS LIST

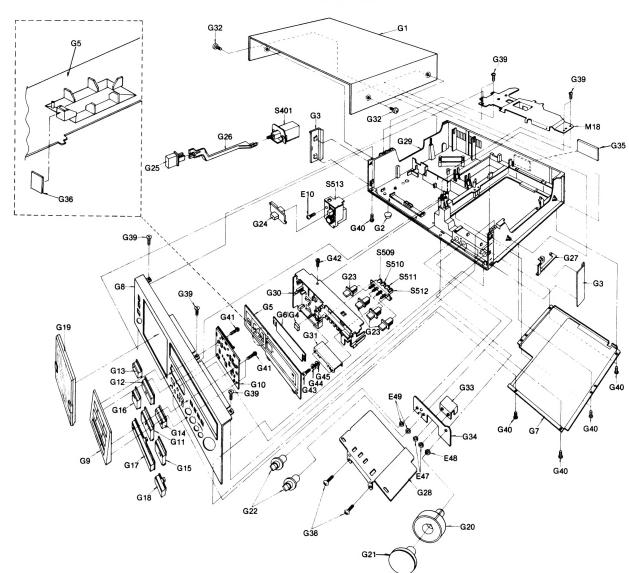
Ref No.	Part No.	Part Name & Descrip
	CABINI	ET PARTS
G 1	QGCM0058 "Silver Type"	Case Caver
	QGCM0058K "Black Type"	Case Cover
G 2	QKA1086	Case Foot
G 3	QGK3201	Side Board
	"Silver Type" QGK3201K "Black Type"	Side Board
G 4	QBG1736	P.B Cushion
G 5	QGK3223D	Meter Cover
	"Silver Type"	
	QGK3223K	Meter Cover
	"Black Type"	
G 6	QGL1174	Filter
G 7	QYB0411	Button Cover Assemb
G 8	QYP1084	Front Panel Assembl
	"Silver Type"	
	QYP1085	Front Panel Assemib
	"Black Type"	
G 9	QGK3222B	Operation Panel
	"Silver Type"	
	QGK3222K	Operation Panel
	"Black Type"	
G 10	QKJ0518	Push Button Holder
G 11	QXB0758	Operation Button (Pla
G 12	QXB0759	Operation Button (Pa
G 13	QXB0760	Operation Button (Re
G 14	QGO1990	Operation Button (Re
	"Silver Type"	

-54-

# LEAF SWITCH S402: AC POWER VOLTAGE SELECT SW PILOT LAMP **₹** S604 CAPSTAN MOTOR **OVOLTAGE SELECTOR** POWER TRANSFORMER CIRCUIT BOARD MKEY BOARD CIRCUIT BOARD VOLTAGE REGULATOR CIRCUIT BOARD AC POWER CORD TIMER CUIT BOARD 9 FL METER CIRCUIT BOARD [ [2]] (17.53.131) 133 A PUSH SWITCH CIRCUIT BOARD HALL IC CIRCUIT BOARD C BLU .....Blue BRN.....Brown GRY.....Gray BRAKE PLUNGER GRN ...Green L. BLU ...Light Blue NIL .....No Color Mark ORG ...Orange PNK.....Pink RED... ...Red SLD .....Shield Wire VLT .....Violet WHT.....White YEL .....Yellow

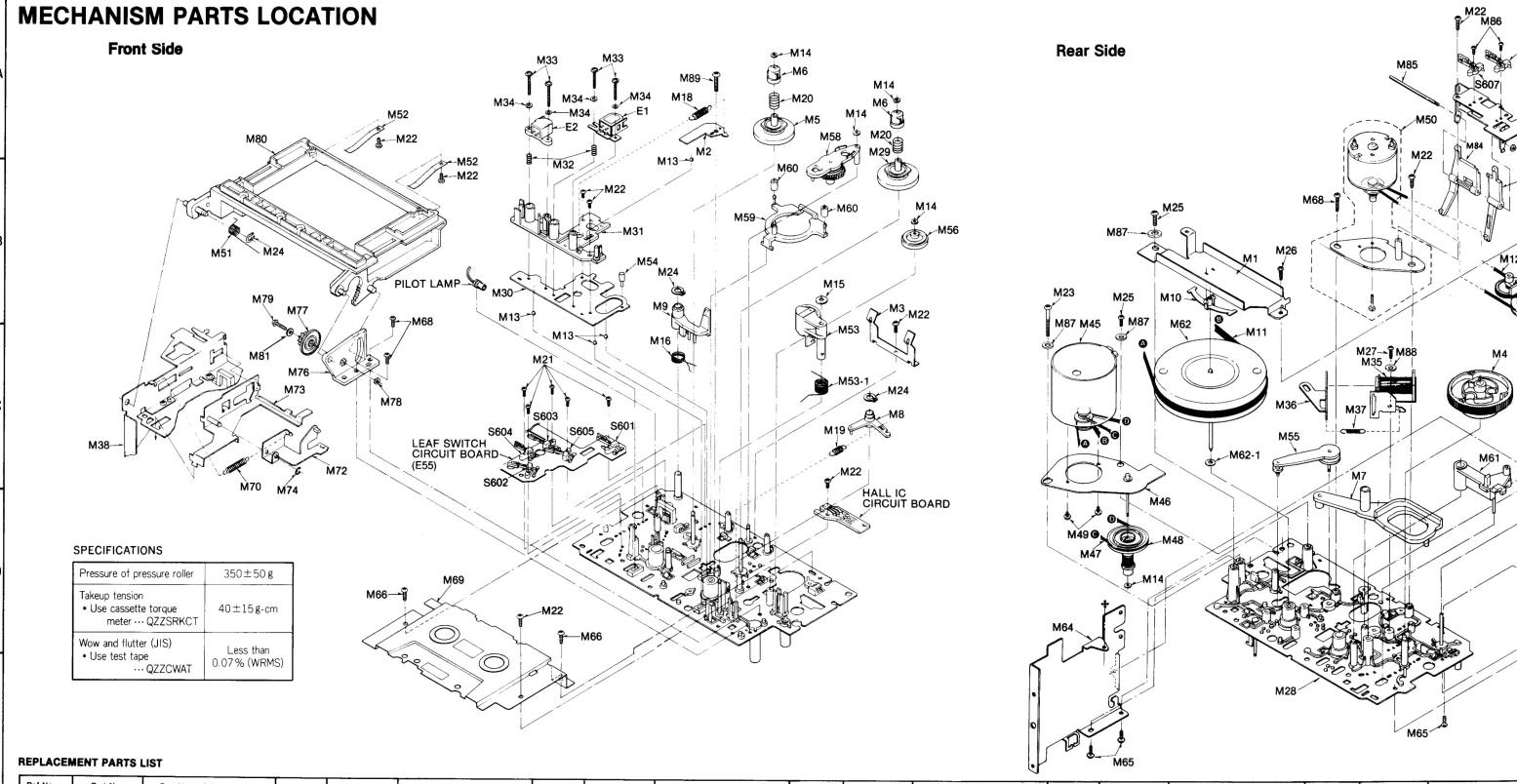
— 54 —

# **CABINET PARTS LOCATION**



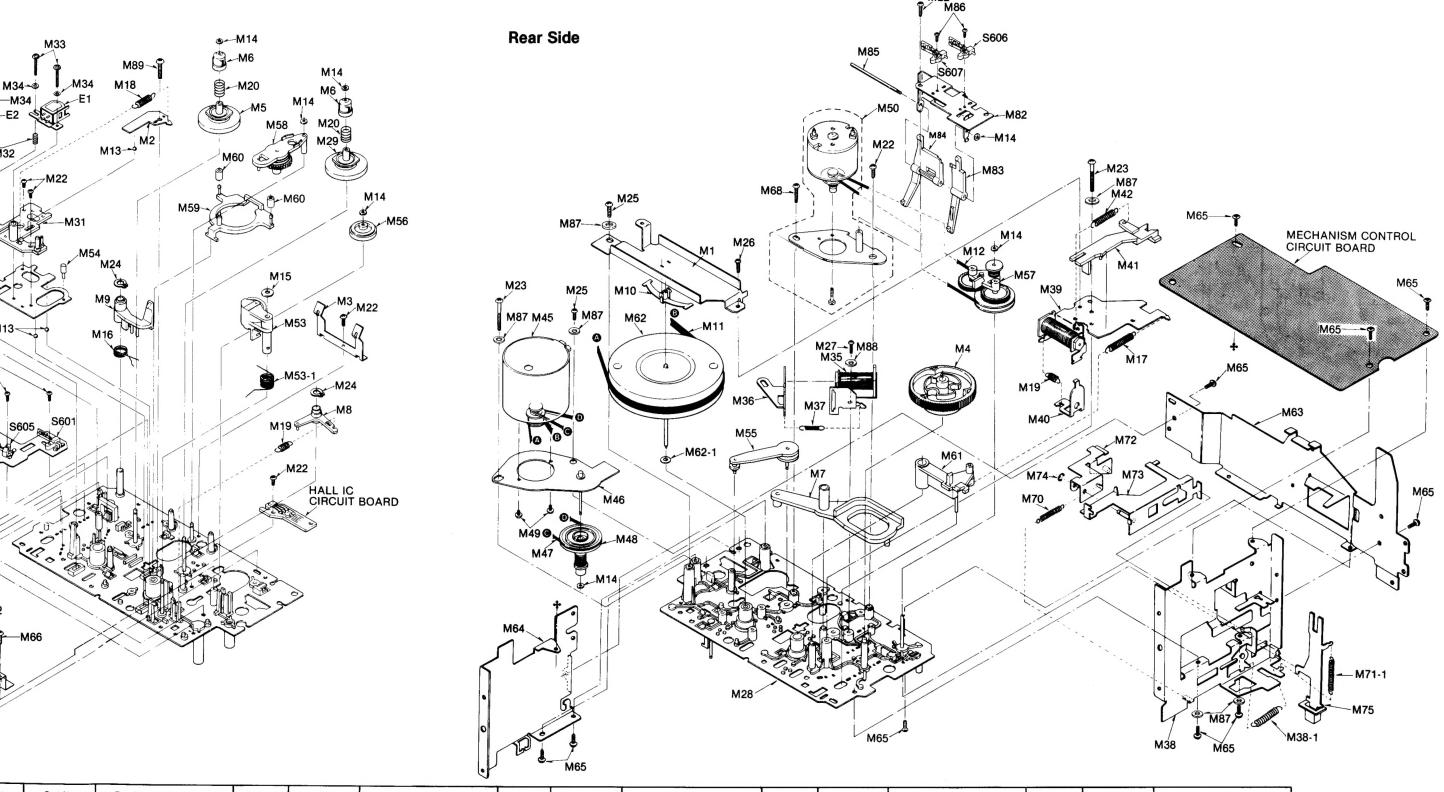
#### REPLACEMENT PARTS LIST

Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
	CABINE	ET PARTS		QGO1990Y	Operation Button (Rec Mute)	G 31	QTW1279	Meter Insulating Plate
			G 15	"Black Type" QGQ1991	Operation Button	G 32	XTB4 + 8BFN	Screw ⊕4×8
G 1	QGCM0058 "Silver Type"	Case Caver	G 15	"Silver Type"	(Fast Forward)		"Silver Type" XTB4 + 8BFZ	Screw ⊕4×8
	QGCM0058K "Black Type"	Case Cover		QGO 1991Y	Operation Button	G 33	"Black Type" QTS1575	Microphone Shield Plate
G 2	QKA1086	Case Foot	1	"Black Type"	(Fast Forward)			
G 3	QGK3201 "Silver Type"	Side Board	G 16	QGO1993 "Silver Type"	Operation Button (Rewind)		QMA4363 QGS2975	Volume Angle Main Name Plate
	QGK3201K	Side Board	1	QG01993Y	Operation Button (Rewind)	G 36	ed Kingdom.] QBH2012	Cover Cushion
_	"Black Type"		i	"Black Type"	operation Button (newing)	G 38	XTN3 + 10B	Tapping Screw
G 4	QBG1736	P.B Cushion	G 17	QGO1994	Operation Button (Stop)	G 39	XTS3 + 12B	Tapping Screw
G 5	QGK3223D	Meter Cover		"Silver Type"	-роланон дамон (олор)	G 40	XTN3 + 10B	Tapping Screw
	"Silver Type" QGK3223K	Meter Cover		QG01994Y "Black Type"	Operation Button (Stop)			SSORIES
0.0	"Black Type"	E	G 18	QGO1995	Push Button (Counter Reset)	1		
G 6 G 7	QGL1174 QYB0411	Filter Button Cover Assembly	G 19	QYF0542	Cassette Lid Assembly	A 1	RP023A	Connection Card
G 8	QYP1084	Front Panel Assembly	1	"Silver Type"		A 2 [D]	QQT3217	Instruction Book
G 6	"Silver Type"	From Faner Assembly		QYF0542K	Cassette Lid Assembly	[For all E	uropean areas exc	ept United Kingdom.]
	QYP1085 "Black Type"	Front Panel Assembly	G 20	"Black Type" QYT0636	Volume Knob-R		QQT3218 ed Kingdom.]	Instruction Book
G 9	QGK3222B "Silver Type"	Operation Panel	G 21 G 22	QYT0637 QGT1569	Volume Knob-L Select Knob		PAC	KINGS
	QGK3222K "Black Type"	Operation Panel	G 23 G 24	QGO2043 QGO2042	Function Button Timer Buttom	P 1	QPN4290	Inside Carton
G 10	QKJ0518	Push Button Holder	G 25 G 26	QGO1900 QMR1986	Power Button Power Rod	P 2 P 3	QPA0654 QPA0655	Cushion-A Cushion-B
G 11	QXB0758	Operation Button (Play)	G 27	QJC0049	Earth Plate-A	P 4	XZB50X65A02	Poly Bag
G 12	QXB0759	Operation Button (Pause)	G 28	QTS1579	Shield Plate	P 5	QPS0618	Pad
G 13	QXB0760	Operation Button (Record)	G 28	QTS1576	Meter Shield Plate	P 6 P 7	QPC0072	Sheet
G 14	QGO1990 "Silver Type"	Operation Button (Rec-Mute)	G 29 G 30	QKM1512 QMK1959	Main Case Asembly Sub Chassis		QPA0662	Spacer



	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Descrip
	M 1 M 2	MECHANIC QMA4330 QBP1894	Flywheel Retainer	M 13 M 14 M 15 M 16	QDK1012 QBW2008 QBW2046 QBN1772	Steel Bail Snap Washer Snap Washer	M 27 M 29 M 30	XTN26 + 8B QXD0120 QMK1867	Tapping Screw Takeup Reel Table Assembly Head Base Plate	M 41 M 42 M 45	QML3653 QBT1278 QXU0280	Control Lever Record Lock Lever Spring Capstan Motor Assembly	M 56 M 57 M 58	QXi0116 QXL1408 QXL1409	Takeup Idler Swing Gear Lever Assembly Fast Wind Arm Assemlby	M 69	QXH0390 "Silver Type" QXH0390K	Mechanism Cover  Mechanism Cover
1 1	M 3 M 4 M 5	QBP1895 QXG1059 QDR1146	Head Base Plate Spring Cassette Pressure Spring Maim Gear Supply Reel Table	M 17 M 18 M 19	QBT1725 QBT1927 QBT1920	Erase Safety Lever Spring Lock Lever Spring Head Base Plate Spring Idler Spring	M 32 M 33	QMZ1252 QBC1103 XSN2 + 16	Head Spacer  Head Spring  Screw ⊕2×16	M 46 M 47 M 48 M 49	QXA1077 QDB0286 QXP0621 XSN26 + 3	Motor Retainer Assembly Takeup Belt Takeup Pulley	M 59 M 60 M 61	QML3659 QBG1132 QXL1411	Brake Lever Brake Rubber Lock Lever Assembly	M 70	"Black Type" QBT1691 QBT1566	Lamp Lever Spring-B
	M 6 M 7 M 8	QMB1336 QML3655 QML3660	Reel Table Hub Cam Follower Idler Select Lever	M 20 M 21	QBC1373 XTN2+6B	Reel Table Spring Tapping Screw	M 34 M 35 M 36	XWG2 QXA1232 QML3865	Washer Brake Plunger Assembly Plunger Lever	M 50 M 51 M 52	QXU0250 QBN1878 QBP1946	Screw ⊕2.6×3 Reel Motor Assembly Holder Spring Cassette Lock Spring	M 62 M 63 M 64	QXF0190 QMA4358 QMA4359	Flywheel Assembly Center Angle Side Angle-R	M 72 M 73 M 74	QXL1414 QXL1507 XUC25FT	lock Lever-A Lock Lever-B Stop Ring
	M 9 M 10 M 11	QML3661 QMZ1283 QDB0306	Erase Safety Lever Flywheel Thrust Retainer Capstan Belt	M 22 M 22 M 23	XTN26 + 6BFZ XTN26 + 6B XTN3 + 24B	Tapping Screw Tapping Screw Tapping Screw	M 37 M 38 M 38-1	QBT1955 QXA1222 QBT1755	Plunger Spring Side Angle Spring Side Angle Spring	M 53 M 53-1	QXL1406 QBN1771	Pressure Roller Lever Pressure Roller Spring	M 65 M 65 M 66	XTN3 + 6B XTN3 + 8B XTN26 + 6BFZ	Tapping Screw Tapping Screw Tapping Screw	M 75 M 76 M 77	QXR0780 QKJ0499 QDG1254	Eject Rod Assembly Dumper Gear Holder Dumper Gear
1	M 12	QD80287	Reel Motor Belt	M 24 M 25, 26	XUB4FT XTN3 + 10B	Stop Ring Tapping Screw	M 39 M 40	QXA1076 QML3651	Trigger Plunger Assembly Trigger Plunger Lever	M 54 M 55	QMN2625 QXL1423	Eccentric Pin Idler Lever Assembly	M 68	XTN26 + 10B	Tapping Screw	M 78 M 79	XNG26 XSN26 + 8B	Nut Screw

# RS-M255X RS-M255X



o. Part N		Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
XTN26 + 8 QXD0120		M 41 M 42	QML3653 QBT1278	Control Lever Record Lock Lever Spring	M 56 M 57	QXi0116 QXL1408	Takeup Idler Swing Gear Lever Assembly	M 69	QXH0390 "Silver Type"	Mechanism Cover	M 80	QMH2085 "Silver Type"	Cassette Holder
QMK1867 QMZ1252	Head Base Plate Head Spacer	M 45 M 46	QXU0280 QXA1077	Capstan Motor Assembly Motor Retainer Assembly	M 58 M 59	QXL1409 QML3659	Fast Wind Arm Assembly Brake Lever		QXH0390K "Black Type"	Mechanism Cover		QMH2085K "Black Type"	Cassette Holder
QBC1103		M 47 M 48	QDB0286 QXP0621	Takeup Belt Takeup Pulley	M 60 M 61	QBG1132 QXL1411	Brake Rubber Lock Lever Assembly	M 70	QBT1691	Lamp Lever Spring-B	M 81 M 82	XWG26 QMA4072	Washer Auto Tape Selector Angle
XSN2 + 10 XWG2	S Screw ⊕2×16 Washer	M 49 M 50	XSN26 + 3 QXU0250	Screw ⊕2.6×3 Reel Motor Assembly	M 62	QXF0190	Flywheel Assembly	M 71 M 72	QBT1566 QXL1414	Intermediate Lever Spring lock Lever-A	M 83	QML3716	Tape Detection Lever (for Normal/CrO, Tape)
QXA1232 QML3865	Brake Plunger Assembly Plunger Lever	M 51 M 52	QBN1878 QBP1946	Holder Spring Cassette Lock Spring	M 63 M 64	QMA4358 QMA4359	Center Angle Side Angle-R	M 73 M 74	QXL1507 XUC25FT	Lock Lever-B Stop Ring	M 84	QML3717	Tape Detection Lever (for Metal Tape)
QBT1955 QXA1222		M 53	QXL1406	Pressure Roller Lever	M 65 M 65	XTN3 + 6B XTN3 + 8B	Tapping Screw Tapping Screw	M 75 M 76	QXR0780 QKJ0499	Eject Rod Assembly Dumper Gear Holder	M 85 M 86	QNM2642 XTN2 + 5B	Detection Lever Shaft Tapping Screw
QBT1755 QXA1076		M 53-1 M 54	QBN1771 QMN2625	Pressure Roller Spring Eccentric Pin	M 66 M 68	XTN26 + 6BFZ XTN26 + 10B	Tapping Screw Tapping Screw	M 77 M 78	QDG1254 XNG26	Dumper Gear Nut	M 87 M 88	XWG3 XWG26	Washer Washer
QML3651	Trigger Plunger Lever	M 55	QXL1423	Idler Lever Assembly		ATTILO F TOD	Tupping Golda	M 79	XSN26 + 8B	Screw	M 89	XTN26 + 12B	Tapping Screw

Y.F DDKBBK